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Predicting the Clinician's Behavioural Intention to Supply Adequate Information on the X-Ray Request Communication Tool in Kenyan Hospitals: Literature Review

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Abstract:

Introduction: Effective communication in healthcare is essential for delivery of quality services. The X-ray request forms are vital written communication tools for referring patients to the X-ray department from the clinician to the radiologist/radiographer (Depasquale & Crockford, 2005). Currently, many scholars have demonstrated a growing concern regarding the high number of unjustified radiation exposures to patients because of provision of inadequate information on the x-ray request forms by clinicians to the radiologists. Furthermore, inadequate or incomplete information on the request form leads to medical errors besides the delay of radiological examination reports thus interfering with optimal patient care. In non-clinical populations, an individual's "intention to do something" is the most proximal predictor of the actual behaviour. Many scholars consider clinical practice a form of human behaviour in which cognitive theories may proffer a scientific basis for the choice of intervention to use in the implementation of new practice (Eccles et al, 2006). The cognitive clinical behaviour of providing adequate information on the x-ray request forms warrants investigation to establish the most proximal cognitive predictor upon which to direct interventional measures.

Problem Statement: Interventional strategies informed by theory lead to successful behavioural change and communication. Most of the documented studies worldwide on X-ray prescription have dwelt on assessing the adequacy of the X-ray prescription request form as a communication tool, but they have not investigated the clinician's behavioural intention to supply the requisite information on the X-ray request form. These studies being clinical audits of the X-ray request forms are bereft of theory. The decision to engage in a particular clinical behaviour involves interplay of cognitive variables like attitude and personal etiquette. Nevertheless, according to Eccles et al (2006) the other modifiable constraints like governance and legal framework act as control variables of clinical behaviour. The purpose of the present study was to fill the gap in the literature by incorporating a theory driven model in identifying the influence of cognitive predictors on the clinician's behavioural intention to provide adequate information on the X-ray request form.

Objectives: The main objective of the study is to review literature about the influence of cognitive factors on the clinician's behavioural intention to supply adequate information on the X-ray request communication tool in Kenya.

Method: Literature search via various electronic journal search engines based on the following Key words: X-ray request form, radiology referral communication, cognitive factors influencing clinical behaviour

Conclusion: Understanding the influence of cognitive factors of the clinician's behavioural intention to provide adequate details on the X-ray request form as a communication tool is paramount in the design of intervention strategies to improve interpersonal communication between healthcare providers that in turn will improve patient-care.

Keywords: X-ray request form, adequacy of the radiology referral form, predicting clinician behavioral intention

1. Introduction

1.1. Background to the Problem

Communication between individuals is a matrix of thought and the relationships that exist between people with express generation and transmission of meaning (Jooste, 2003). The basis of all human relations is communication given that human achievement is unsustainable if people are bereft of the ability to communicate. Communication is the cement that stabilizes a human being's existence within a family, social group, community, nation and the world at large. Communication is not only a person's way of

expressing his or her humanity, dignity, needs, strengths, objectives and concern for other people, but it also comprises the very bricks and mortar that build civilizations (Searle, 2004). Lemone and Burke (2004) are of the opinion that quality interpersonal communication is essential in the utility of written communication like in the case of filling X-ray request form.

Radiology request forms are essential communication tools for referring patients to the X-ray department from the clinician to the radiologist/radiographer. As a written tool of communication, its importance should not be underestimated. The Royal College of Radiologists clearly suggests that all request forms need to be adequately and legibly completed to avoid any misunderstanding of the request (Depasquale & Crockford, 2005). According to Radiation Protection Regulations of European Union Nations (1997), the referring doctor has the responsibility for the collection of all diagnostic information that justifies the requested radiological examinations as well as information about previous exposures. The clinician is required to state the reason for referral as this helps radiologists to understand the patient's condition; so that the required expertise may be utilized to proffer the necessary information to aid proper patient management according to the relevant articles of the Radiation Protection Regulations of European Union Nations (Akinola, Wright & Orogbemi, 2010).

Radiological Request Forms (RRFs) are template forms whose form fields define minimum radiology request information required by a radiology department to review the justification of the request, decide on examination protocol and to verify radiology request information before exposing the patient (ECRP, 2000:11; IAEA, 2008:13). They are medico-legal documents and form the framework for requesting radiology examinations (Adebayo *et al.*, 2009; Oswal *et al.*, 2009; Longrigg & Channon, 2006; Jumah *et al.*, 1995). The content of radiological request forms must therefore be complete and accurate in order to facilitate justification of exposures (IAEA, 2008: 9 and Pelletier *et al.*, 2005). This ensures that incase medical malpractice is alleged, the information documented on the request form should withstand scrutiny in court (Spurgeon *et al.*, 2011). Furthermore, the accurate and complete information contained in a request form is an integral part of note keeping in radiology and therefore allows the radiology department to provide informed and justified care (Adebayo *et al.*, 2009; Oswal *et al.*, 2009; Longrigg & Channon, 2006; Jumah *et al.*, 1995). In this regard, complete, accurate and justified radiological examination requests comprise three essential components of radiology practice, which are prerequisite to a functional radiology referral system (Rehani, 2010; Oswal *et al.*, 2009; IAEA, 2008: 9; Remedios & McCoubrie, 2007).

In a large percentage of patients, radiology request forms play a pivotal role in both diagnosis and treatment; hence central to this is the adequate completion of the radiology request forms. The junior member of the team often completes the request forms but the most senior member of the clinical team is the one that usually reads the report informing patients management decisions (The Royal College of Radiologist, 2000).

Choosing the appropriate investigation at the right time and providing correct biographic and clinical information of the patient is the responsibility of the clinician or medical practitioner requesting for the radiological investigation (Depasquale & Crockford, 2005). Filling of the request forms adequately reduces the number of unhelpful radiographic examinations performed and aids concise radiological diagnosis. It also indirectly helps to reduce the investigation time and improve the quality of service offered to the patients (Dhingsa *et al.*, 2002). It also helps in the justification for radiation exposure to reduce radiation dose to the patient (Triantopoulou *et al.*, 2005).

No standard format for radiology request forms exists, however different organizations use their own customized version (Jumah *et al.*, 1995). A review of different studies has shown some frequent and common fields on radiology request forms of different organizations. This kind of format constitutes the basic minimum standard for radiology referrals unique to every patient. The prevalence of inadequately completed radiology request form is widespread (Agwu & Okoye, 2005) and Yousef *et al.* (2011) further quote Clark (2005) that it is a worldwide problem thus requiring a quantitative study of our local practice to uncover the factors influencing the behavior of clinicians in this regard.

1.2. Problem Statement

Complete, accurate and justified radiological examination requests are prerequisite to radiological exposures (Rehani, 2010; Oswal *et al.*, 2009; IAEA, 2008: 9; Remedios & McCoubrie, 2007). However, global research shows evidence of high numbers of incomplete and inaccurate requests as well as that up to 77% radiological exposures are unjustified. In today's medical practice, imaging plays a major role in patient management with the ready availability of revolutionary technology (Slack, 2009). However, interpretation of the results depends on the background knowledge of the patient. The reason and justification for the investigation is mandatory on the request form. This input is essential to the radiologist from the clinician. Jumah *et al.* (1995) avers that since there are no uniform standard request forms, each hospital adapts its own version suitable for appropriate referral. Inadequate or incomplete information on the request form takes away much of the time of radiologist in searching or imagining the clinical condition of the patient. Besides the full demographic data of the patient such as the name, age, sex, address including the telephone number, date, the form should show the name and signature of the referring physician (Hogg, Williams and Norton, 2007). This is helpful to contact the physician for discussion on the clinical issues and even to locate the patient if not yet shifted to the imaging department.

Incomplete and inappropriate requests for radiological investigations are a wasted exercise and create scope for error with resultant unnecessary repetitions and radiation to the patient. Literature survey reveals a large number of studies addressing adequacy of filling of radiology request forms. Jumah *et al.* (1995) recommended necessary steps to correct the common faults in filling the requisition forms. With the growing concern for increasing radiation exposure, it was necessary to audit the compliance rate and justification for the requests at the University Teaching Hospitals and General Practitioner referral patterns (Triantopoulou *et al.*, 2005). The Royal College of Radiologists Research Group audited the adequacy of clinical information on the X-ray request forms from accident and emergency department (Cohen, Curtin & Lee, 2006).

While evaluating the quality of radiology requisitions for intensive care unit patients Cohen et al noted shortcomings in documentation and communication resulting in poorer outcomes (Shaw, Moxham, & Cairns, 2010). It is also observed in almost a third (30%) of all radiological requests were made by doctors who have had no clinical contact with the patient and as such, there is a real risk that standards of patient care and safety have fallen (Walker & Tuck, 2000).

The Radiation Protection of Patients Unit (RPOP) of the International Atomic Energy Agency (IAEA) conducted consultations in the area of diagnostic radiology and established that there was a significant level of inappropriate usage of diagnostic radiology (IAEA, 2008: 1). In its conclusions, the IAEA (2008: 1) stresses that there is need for improved communication of request data that could guarantee justification of diagnostic radiological exposures. Therefore, the design of radiological request forms and the compliance of referrers in completing these forms are essential for effective justification of radiological exposures (Oswal *et al.*, 2009; IAEA, 2008: 1).

In Kenya, a study conducted by the Kenya Ministry of Health (MoH) looked at 491 X-ray request forms over a three-month period together with their accompanying radiographs at the Radiology Department of Kenyatta National, Hospital, Nairobi, from January to March 2000. Patients covered in the study originated from various departments including the casualty, wards, general clinics and private clinics. They ranged from 5 weeks to 78 years in age. The study found that 334 (68%) of request forms were inadequately filled. Of the different parameters requested for on the forms, filling in of menstrual history (LMP) was the poorest (10.4% LMP given), while age and sex were relatively well filled in. Analysis of the various departmental referrals showed that patients referred from private clinics had the most inadequately filled forms, while provision of clinical history was also the poorest for these patients. Of the films that were unreported, 46.5% were due to radiographic faults including film-fog, poor exposure and processing, while 30.2% lacked adequate patient information.

Many researchers have investigated completeness, accuracy and justification of radiological requests (Akinola *et al.*, 2010; Oswa *et al.*, 2009; Ya'ish *et al.*, 2007; Adebayo *et al.*, 2005; Triantopoulou *et al.*, 2005; Eccles *et al.*, 2001; Jumah *et al.*, 1995; McNally *et al.*, 1995: 640-642; Oakeshott *et al.*, 1994:197-200; Maclaren *et al.*, 1993:138-144; Scally, 1993 and Cook *et al.*, 2003). This is consistent with IAEA (2008). However, none of these researches pertains to establishing the influence of underlying cognitive determinants of this errant clinical behavior regarding the adequacy of x-ray request form in Kenya, which is what this study seeks to address. Above all, the findings shall form the basis for design of effective theory based health behavior change communication interventions in order to promote quality patient care.

1.3. General Objective

Establish the influence of the cognitive predictors on the clinician's behavioural intention to supply adequate information on the X-ray request form in Kenya.

1.4. Specific Objectives

1. Determine whether the clinicians' knowledge and skills facilitates the behavioural intention to supply adequate details on the X-ray request form.
2. Establish the influence of salience of the clinicians' belief on the behavioural intention to supply adequate details on the X-ray request form.
3. Assess the influence of the clinician's perceptions on the behavioural intention to supply adequate details on the X-ray request form.
4. Find out the influence of the clinician's habit on the behavioural intention to supply adequate details on the X-ray request form.
5. Explore the influence of environmental constraints on the clinician's behavioural intention to supply adequate details on the X-ray request forms.
6. Determine the most proximal cognitive predictor of the clinician's behavioural intention to supply adequate details on the X-ray request form

1.5. Research Questions

1. Does the clinician's knowledge and skills facilitate the clinician's behavioural intention to supply adequate details on the X-ray request form?
2. Does the salience of the clinician's belief impede or facilitate the behavioural intention to supply adequate details on the X-ray request form?
3. How do the clinician's perceptions influence the behavioural intention to supply adequate details on the X-ray request form?
4. What is the influence of the clinician's habit on the behavioural intention to supply adequate details on the X-ray request form?
5. What is the influence of environmental constraints on the clinician's behavioural intention to supply adequate details on the X-ray request forms?
6. Which is the most proximal cognitive predictor of the clinician's behavioural intention to supply adequate details on the X-ray request form?

1.6. Justification

This study is important to various stakeholders for the following reasons:

The study is important not only to x-ray health planners but also to health communication experts in the design of intervention strategies. It may help them lay out strategies to improve health care delivery and effective health communication between healthcare providers in Kenya.

The study will be a source of reference material for future researchers on other related topics; it will also help other academicians who will undertake the same topic in their studies.

The study will also highlight other important relationships that require further research.

1.7. Scope

The study will be carried out among duly licensed medical practitioners in Kenya based on the cognitive theoretical Integrated Behavioral Model.

1.8. Limitation

The research will be limited to behavioural self-reports on the utility of the X-ray form as a communication tool and the researcher has no control over the way the respondents will answer questions.

2. Literature Review

2.1. Introduction

This chapter presents the theoretical framework of the study as analysed from the objectives and shows how the independent variables affect the dependent variables. The critique of the literature follows and the chapter concludes with critique of the literature.

2.2. Theoretical Review Framework

The review focuses on the applicability of the Integrated Behavioral Model in understanding the interplay between the independent and dependent variables in the proposed study. An Integrated Behavioral Model accounts for different health behaviors in different populations (Fishbein, 2000, Fishbein, 2008). The integrative model takes a reasoned action approach to understanding behavior, which holds that although an infinite number of variables may in some way influence behavior, only a small number of variables need to be considered to predict, change, or reinforce a particular behavior in a particular population (Fishbein & Ajzen, 1975, Fishbein, 2010).

The Integrated Behavioral Model espouses five components that directly affect behavior: Similar to the Theory of Reasoned Action or Theory of Planned Behavior (TRA/TPB), the most important determinant is intention. Without intention to do so, an individual is unlikely to carry out a behavior. Behavioral intention is determined by attitude, perceived norms, and personal agency (self-efficacy / perceived power). An individual needs the knowledge and skills to carry out the behavior. The behavior should be salient to the individual (that is, important to the person and at the forefront of their thoughts). There should be few or no environmental constraints that make behavioral performance difficult. With experience performing the behavior, the behavior will become habitual for the individual. The integrative model predicts that people act on their intentions when they have the necessary skills and when environmental factors do not impede behavioral performance. According to Fishbein and Ajzen, (1975, 2010) when people do not perform a recommended behavior but did intend to, the objectives of an intervention would not be to improve intention. The problem here is not one of motivation but one of competence (i.e., skills) and means (i.e., environmental constraints or facilitators). The integrative model and other reasoned action theories have been widely used to investigate a broad range of health behaviors. There is meta-analytical support for the theory's ability to explain different health behaviors (e.g., Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Hagger, Chatzisarantis, & Biddle, 2002). The integrative model is applicable in this study as it accommodates two routes to behavior change; one, use messages to change those beliefs that are most strongly related to intention to perform the behavior, and two, use messages to reinforce beliefs in favor of the recommended behavior that are already held by most members of the population.

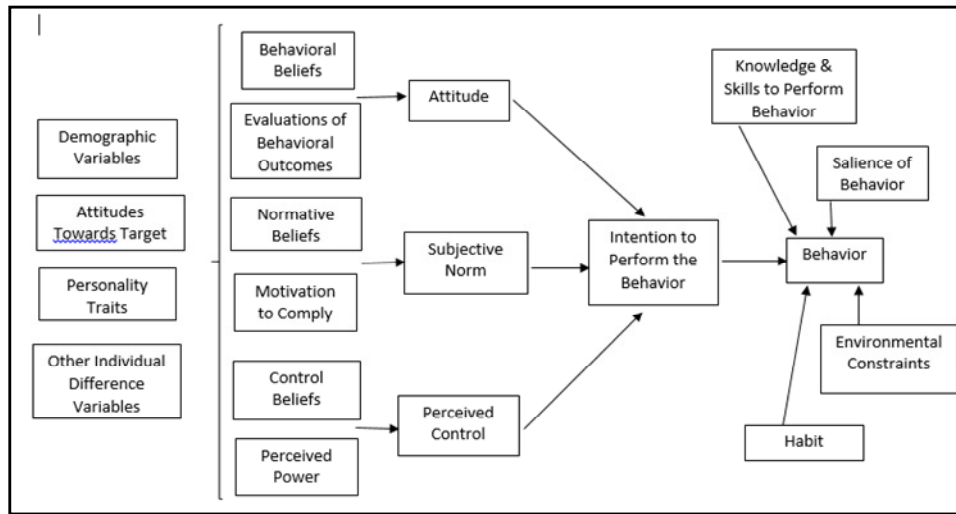


Figure 1: Integrated Behavioral Model

Source: <https://ph725theorywiki.files.wordpress.com/2013/10/ibm.png> accessed on 17/12/2015

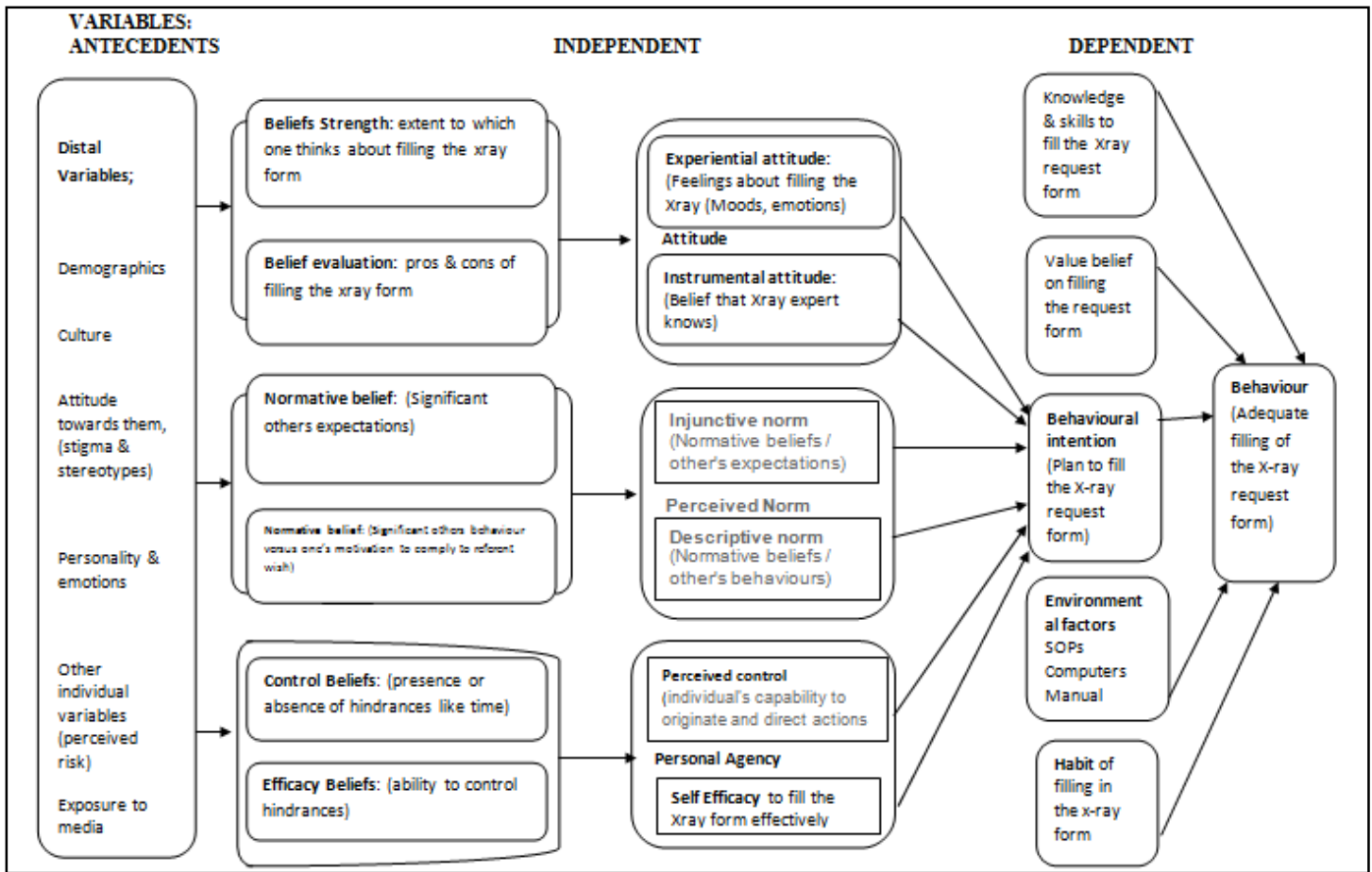


Figure 2: Application of the IBM in exploring the influence of cognitive factors on the adequacy of the X-Ray request form

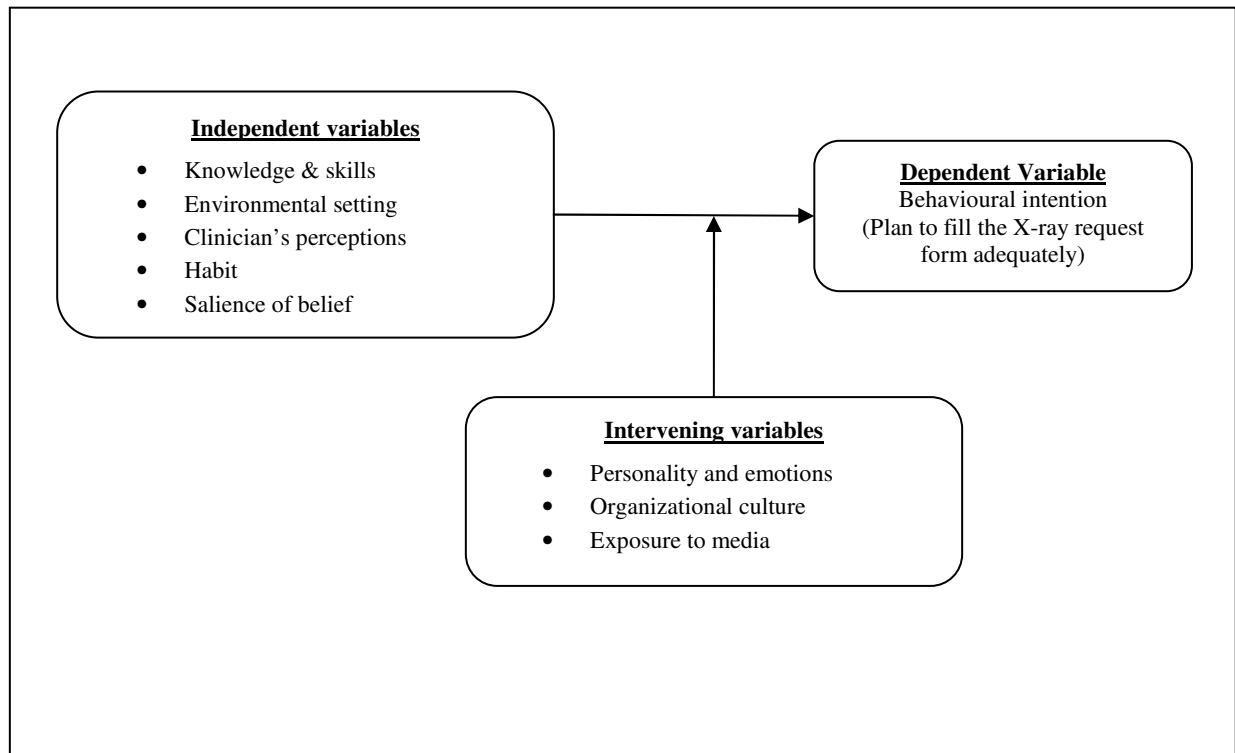


Figure 3

2.3. Other similar Theories of Health Behavior Change Communication

- The Health Belief Model (Janz and Decker, 1984; Strecher & Rosenstock, 1997) was introduced with an intention to explain why people did not participate in programs that could help them diagnose or prevent diseases. The model has been applied to a broad range of health behaviours and subject populations. These include health promotion, sick role behaviours, and clinic use. The constructs of the theory are perceived threat, perceived susceptibility, perceived benefits, perceived barriers, self-efficacy, and cues to action. Health Belief Model is a psychosocial model limited at explaining individual variance in health related behaviours while ignoring other forces that influence health such as interpersonal factors, processes, institutions, and community factors, public policy and laws (Janz and Decker, 1984).
- Social Cognitive Theory (Social Learning Theory) explains behaviour as a result of three reciprocal factors: behaviour, personal factors, and outside events (Bandura, 1997). The main constructs of the theory are: Attention, Retention, Reproduction, Motivation, Performance, and Self- efficacy. The model has useful in understanding health related behaviours such HIV/AIDS but it is limited in its lack of recognition of the role of group norms and collective efficacy (Airhihenbuwa, Makinwa, & Obregon, 2000).

3. Review of empirical literature

3.1. Level of Knowledge & Skills Influences Adequacy of X-Ray Requesting Form

Competent clinical level of education and reflective problem solving through critical thinking are ethical imperatives for health care providers at all levels, because human lives stand endangered any time poor decisions are made during the course of medical diagnosis and treatment. Fishbein (2008) analyzes the transition in defining the terminology for critical thinking over the past three decades and states that the current definition used in nursing is well established although there remains a propensity toward using alternative terminology which often causes confusion. Because clinical problem solving, reasoning and decision making are all skills that rely heavily on the cognitive processes inherent in critical thinking, many health professions educators view the terms synonymously. There are subtle differences however.

Kozier et al., (2004) describe the relationship as follows; critical thinking is the constant overarching component, the method by which we employ clinical reasoning leading to sound clinical judgments due to one's level of education, making critical thinking the central component for development of expert clinical practice. Clinical judgment is defined as making a choice between alternative actions when there may not be a clear direction. Described as thinking-in-action, the student is open to reassessing and changing actions as the situation warrants. In other words, clinical judgment is the discipline specific approach to critical thinking. In many instances, communication is so natural that the importance of doing it well is often underestimated (Iles and Sutherland, 2001). However, owing to growing interest in health promotion and disease prevention, health communication in developing countries like South Africa has been encouraged. Some of the roles that effective health communication between health care workers can play, according to these

authors, include guiding effective health care ensuring effective health promotion facilitating effective dissemination of health information.

Writing in the editorial comment, Larkin (2012) explains in another context that radiologists encounter difficulties in obtaining consistent information from various health workers as to the relative risks and benefits of treatment options available. Manning (2010) states that despite the fact that a radiological examination carries a definite long-term risk, patients undergoing x-ray examinations often receive no or inaccurate information about these risks. Moreover, Slack (2009) reports that information is an important factor leading to an informed choice. Therefore, radiologists can only make informed decision about x-ray examination when clinicians correctly provide information. It has been argued that it is the responsibility of health care staff to communicate and provide first-hand information about on the procedure needed to the radiologists.

Literature indicates that patient satisfaction and adherence to health care instructions is linked to better health workers' communication (Maynard, 2012). Other studies also show that the level of patient compliance with treatment appears to be related to the amount of information given to the patient by health providers. In fact, quality patient information is considered as an important aspect of today's health care. Effective and clear communication between health care providers and risk associated with x-rays influence the trend of services offered. Therefore, other than addressing the emotional needs, Muir (2013) suggest that health care workers should provide objective facts about x-rays.

Nawrocki (2012) went further to speculate upon potential reasons for inadequate information in submissions, including time pressures of clinicians, lack of awareness regarding the importance of the information to the radiologists, and even the open-ended nature of x-ray submission forms in human medicine. Surprisingly, despite the prevalence of informational deficiencies, such deficiencies were clearly not the most significant problems in x-ray submission, because clinicians chose to do nothing about them in the majority of cases, choosing instead to take action mainly when the identification of a specimen was in question. In another study conducted by Muir only 2.2% of cases determined to be deficient of information at the time of submission had no additional attainable case information through contact with the individuals and records related to the case. Thus, in the vast majority of cases in which there is incomplete information, the submitting clinician could have provided more information and most deficiencies found at submission could ameliorate easily with access to clinicians and patient records. However, due to the prevailing predilection to ignore issues of inadequate clinical information and despite the relative ease of remediation in such cases, inadequate and deficient submissions can have significant time, monetary, diagnostic, and legal ramifications associated with them.

3.2. Environmental Barriers Influences Adequacy of X-Ray Requesting Form

Workplaces contain a plethora of variables that may lead to make what constitutes efficient and effective processes as well as ineffective processes. These variables include, but are not limited to, machinery, culture, social and physical environment, and people themselves. Though a workplace may acquire all variables required to produce certain widgets or provide a given service, there is no guarantee that a desired level of output or accordance will be achieved (Albarracín et al., 2001). Although not all human variables are manageable, processes and attempts to understand how humans interact in these processes can. In order to accomplish sustainability and quality in health practice, hospitals need to look at their day-to-day interactions from multiple vantage points. One such way supervisors are fulfilling their fundamental needs of sustainability while simultaneously encouraging quality output is through change (Hargreaves and Mackay, 2003).

Hospitals cannot be steadfast on health practices and routines that worked two years ago or even two months ago without thinking towards possible future implications. Hospitals, whether for-profit or non-profit, need to make changes and integrations that breed sustainability as well as innovation. Current ideology and practice emphasizes using teamwork, scarce resources to their fullest potential, and new information technologies for competitive advantage (Furby, 2004). In order to survive, hospitals must continue to adapt their health practices with a focus on the quality of their product through supervision.

The above refers to using scarce resources to their fullest potential amongst x-ray providers. One such way of using these processes for the purpose of quality and sustainability is through effective workflows (Fishbein, 2008). Streamlining of workflows processes impacts positively on overall x-ray requisition effectiveness. The implementation of workflows can add to the effectiveness of any health process, while conversely, a poorly executed workflow can attribute to overall ineffectiveness. It is imperative to perform regular periodic workflow evaluation for effectiveness based on their intrinsic flow as well as their extrinsic coordination with relative processes. The ongoing symbiotic relationships of the inner workings of workflows are extremely important to manage.

Workflows are generally developed and modified because of specific hospital, environmental, or health needs. However, there is no guarantee of continual success just because a workflow is in place. According to Pollitt (2012), beneficial workflow processes are proactive, consistent, efficient, and accountable. Beneficial workflow processes must include all these elements (be proactive, consistent, efficient and accountable) to drive improvements. Oftentimes hospitals face the consequences of workflow that are not consistent or efficient because they are the products of compound workflows, or those that hinge on other existing workflows (Kozier et al., 2004).

Moxham and Cairns (2010) posit that system conversions are necessary to cut down labor costs and improve cash collections. However, many a time, these goals are unachievable because even the best systems cannot make up for poor workflows, processes, and communication. Larkin (2012) provide an example of this phenomenon in a healthcare setting where a new program is initiated: A hospital initiates a new clinical program with complex billing requirements, such as transplants or research initiatives, these processes are often added to existing workflows, creating multiple new steps that reduce efficiency and strain communications among work units. Installation of new applications to support old processes, performance can actually fall below desired levels.

One cannot endeavour to look at behaviour change in isolation. Other factors like availability, accessibility and cost of given health services normally have a bearing on health-related behaviour. The majority of patients in most developing countries still have no access to the most basic diagnostic x-ray services (McConnell and Webster, 2010). In the quest to provide for the basic needs of all citizens, most ministries of health adopt a primary health care approach, this requires that radiographic services be availed at primary, secondary and tertiary centres. Availability and accessibility of the service, thus, may be one of the factors influencing patients' demand for x-ray examinations. In fact, literature shows that availability of a given service is a well-known factor for explaining utilisation (Loughran, 2004). On the contrary, results from a study conducted in Norway show that better access to x-ray services does not necessarily imply increased use of plain radiography.

A study in Turkey reveals that conventional x-ray is the most frequently used modality (Larkin, 2003). This supports the notion that despite technological advances in radiology conventional radiography still remains the dominant imaging modality in many countries especially developing countries. It is estimated between 44,000 and 98,000 Americans die each year from preventable medical errors (Finlay and Liddicoat, 2002). Errors and poor practices are unacceptable for consumers, providers, and the health care system. Health care consumers should feel confident that health care providers are basing decisions on evidence of best practices and that processes are in place to ensure safe and effective delivery of care.

An electronic health record (EHR) is described as a repository that electronically maintains an individual's health information and health care for their lifetime and stores the information in a manner that it can serve multiple legitimate users of the record (Cohen et al., 2006). The purpose of the EHR is to collect, store, and process an individual's health information in a central location (Triantopoulou et al., 2005). Since health information is in a central location, it is accessible to multiple providers to enhance continuity of care and efficiency and cost effectiveness of care. Health information should include, but is not limited to, an individual's demographics, progress notes, identified health problems, medications, prescribed or recommended plan or care, vital signs, past medical history, immunizations, laboratory data and radiology reports. Proficiency in the utility of electronic and computerized mediums of communication is of paramount importance, however if the associated software is outdated and of limited capacity, this is a hindrance factor in communication.

Moxham and Cairns (2010) found a negative relationship between rurality and uptake of x-ray (Adj OR 0.75, 95% CI 0.63–0.90). However, Pollitt (2012) asserts that only 30% of studies (3 of 10) found that rural residence was a significant barrier to the uptake of x-ray. Crockford et al., (2006) have pointed out that transportation problems, such as large distances between residence and health facilities and the absence of mass transit systems, may also present barriers to x-ray in rural areas. Albarracín et al., (2001) found out that x-ray uptake decreased significantly with an increase in travel distance to x-ray facility. Out-of-pocket expenses were found to influence the uptake of x-ray: patients having to pay out-of-pocket costs were less likely to be screened than those who have health insurance policies, to take care of the expenses.

Yates (2011) determined that nurses not only have a positive effect on patient compliance with x-ray, but educate women on identifying x-ray changes and help them to decide what to do if change is identified. Owino (2010) found that the intervention of clinicians is more likely than any factor to act as a motivator for x-ray. However, many healthcare clinics in Kenya do not have adequate number of clinicians and radiologists and their workload is extremely over demanding which again could influence the quality of communication.

3.3. Influence of Clinician's Perceptions on Adequacy of the X-Ray Requesting Form

Attitudes people hold convey information about their beliefs, thoughts and feelings about other people and events (Nuttall, 2005). Attitudes such as caring, warmth, respect and acceptance facilitate communication whereas condescension, lack of interest and coldness inhibit communication. A medical officer needs to be credible. Possessing credibility means a person is worthy of belief and is trustworthy and reliable. Credibility may be the most important criterion of effective communication. To become credible a medical officer needs to be knowledgeable about the subject matter being discussed and must possess accurate information about the situation. A medical officer also needs to convey confidence and be certain about what she or he is saying. For the same reason, it is important that a clinician avoid appearing overconfident or authoritarian (Virjee, 2010).

Medical officers must portray a positive attitude for communication to flow smoothly and to ensure that the patient gets full service in the process, as mentioned by Yates (2011) in his definition of communication as an exchange, and not just an action. All parties must participate fully for the exchange of information to be complete. A medical officer must be able to listen with empathy. Empathy is a personal capacity that will facilitate effective communication when a clinician speaks to a patient on undergoing x-ray. Empathic attitude generally refers to the ability to imagine oneself in another's place and to understand another's feelings, desires, ideas and actions (Akinola et al., 2010).

A strategy likely to enhance the level of attitude in an encounter is paraphrasing. The technique of paraphrasing is repeating back for a patient what they have said to you, using other words, in order to indicate that you have understood the sender's intent. The process should occur at both the emotional and the ideational level of a conversation (Agwu and Okoye, 2005). The individual's health seeking behaviour is to a large extent influenced by his/her own culture, beliefs, attitude and values. For instance, the Theory of Reasoned Action, according to Larkin (2003), argues that beliefs inform attitudes that in turn create behavioural intentions and this predicts human behaviour. In fact, studies on clinician attitude while filling the x-ray forms is as important as factors that influence drug compliance.

However, attitude plays a major role in guiding human behavior toward achieving goals, awareness of its consequences and effective processing of complex information about living environment. Edwards (2005) noted that there has been a rise in the negative attitude displayed by clinicians toward filling the x-ray forms due to unpleasant hard work in the hospital, working on holidays, lack of respect

for work, and low salary. Loss of nurses' interest in what they do, not only negatively affect the quality of work, but also demoralize the profession (Jumah et al., 1995). Applied to this study, x-ray examination may only be seen as a useful intervention if its outcome influences management of a patient in one way or another. Therefore, request for radiological services should be determined by and form part of comprehensive clinical assessment. The demand for x-ray examination by patients ought to be complemented with a basic knowledge and accompanied by an appropriate attitude to its advantages and disadvantages.

Research presents a variety of opinions. A study conducted by Jumah et al., (2013) showed that patients' increased demand for knowledge about their own health was one of the perceived causes of the increased x-ray investigation volume. Therefore, one gets the impression that patients confuse the effects of radiography on outcome measures and its use as a diagnostic tool. Cuthbertson (2011) is of the opinion that satisfaction is subjective and based on expectation and perception. The same researcher adds that satisfaction is dependent on the degree of fulfilment of one's expectation. On the other hand, Walker and Tuck (2000) found that dissatisfaction is a complex social construct underpinned by a range of values, experiences, attitudes and beliefs. Thus understanding health behaviour, in this case demand for x-ray examination displayed by patients, is essential if health care workers are to gain the trust and cooperation of patients and thereby reduce the number of unwarranted x-ray examinations. This means that attempts to influence the behaviour of patients rely on better knowledge of patients' motives, attitudes and beliefs. This is so because some attitudes and beliefs are so strong such that they may influence patients' thinking and behaviour. Likewise, some attitudes and beliefs are weak and hence prone to situational pressure and may have little impact on patients' health-related behaviour.

3.4. Influence of Clinician's Habit on Adequacy of X-Ray Requesting Form

Judah (2012) posits that habit formation is a means to promote maintenance of healthy behaviours, but there have been few investigations into how habits are formed. In an exploratory study sought to model determinants of the formation of a dental flossing habit, including placement of the behaviour within the routine (before versus after tooth-brushing), past behaviour, prospective memory ability, and motivational factors.

In the American Journal of Psychology, Andrews (1908) defines habit as more or less a fixed way of thinking, willing, or feeling acquired through previous repetition of a mental experience. The process by which new behaviours become automatic is habit formation. Old habits are hard to break and new habits are hard to form because the behavioural patterns we repeat are imprinted in our neural pathways, but it is possible to form new habits through repetition. Features of an automatic behaviour are all or some of: efficiency, lack of awareness, unintentionality, and uncontrollability.

In order to determine the extent to which the clinician's behaviour on adequacy of the X-ray request form is habitual requires a practical, reliable and conceptually robust habit measure. The most popular habit measure in the domain is the Self-Report Habit Index as proposed by Verplanken (2003). The Self-Report Habit Index comprises twelve items reflecting on three proposed characteristics of habit: automaticity (e.g. Leaving some areas blank on the X-ray form is something *I do without thinking; frequently*: Leaving blank areas on the X-ray form is something *I do frequently* and relevance to self-identity; Leaving some areas blank on the X-ray form *that is typically me*. Habit-behaviour association and moderation of the intention-behaviour relationship can be derived from the Self-Report Habit Index.

X-ray request forms are essential communication tools used by doctors referring patients for radiological investigations (Fraser and Greenhalgh, 2011). The Royal College of Radiologists clearly arises in order to avoid any misunderstanding; clinicians ensure that there is adequate completion of all radiology request forms legibly. The clinician is required to state the reason for referral as this helps radiologists to understand the patient's condition; so that the required expertise may be utilized to proffer the necessary information to aid proper patient management. However, no standardized format for radiology request forms is available. Different organizations adopt personalized versions (Hogg et al., 2007). The standard is that all request forms received should contain the patient's name, age, address, telephone number, ward, clinical background, and the specific question in need of an answer, the name and signature of referring clinician and the name of the consultant responsible for patient's care.

3.5. Influence of Behavioral Salience of the Clinician on Adequacy of X-Ray Request Form

Godin et al (2008) posits that scholars' utilization of social cognitive theories has led to an improvement in terms of understanding of much health-related behaviour inclusive of those of healthcare providers. The significance with which an individual holds a particular belief or behaviour regarding a certain object tends to inform the attitude towards that particular object. Fishbein proposes in the integrated behavioural model that for one to engage in a particular behaviour, then that behaviour ought to be salient to the individual (that is, important to the person and at the forefront of their thoughts).

Schiavo (2007:94-95) quoting Gardenswart and Rowe (1993) says that behavioral practices heavily hinge on cultural practices of a country and in a cultural set up that conforms to group behaviour like in Kenya, Values tend to be that of group orientation, conformity, preference for harmony, and emphasis on relationships.

3.6. Critique of the Existing Literature Relevant to the Study

The literature and the studies referred to in the above sections confirm the importance of x-ray services (Manning, 2010; Cohen et al., 2006). A number of scholars have attempted to highlight the recognised unwarranted use of radiological investigations and tried to postulate the likely causes without seeking the views of the concerned clinicians. Most of the studies reviewed are clinical audits that seek to generate knowledge that may stem the inappropriate use of x-ray forms by clinicians. While reviewed studies focus on the inadequacy of the x-ray form communication and in particular, on doctors to referring patients for radiographic tests, researchers have not been aware of service users' (patients) views. Writing in the editorial comment, Slack (2009) links patient pressure and

expectation to unwarranted use of x-rays. Despite this acknowledgement, most studies have not focused on the role of interpersonal communication in influencing the x-ray request forms.

The studied literature indicates that both radiologists and clinicians are aware of the importance of information transfer through the diagnostic submission form (Maynard, 2012; Nawrocki, 2012). The practice of consistently providing written clinical information is a reliable mechanism of communication between the clinician and the radiologists via a carefully crafted request form. From this statement, two important inferences emerge; first, that written information supplied by a requisition form is a key component of clinician radiologists' communication and, second, that the way in which the crafted requisition document, that is the layout and phrasing of items on the form, can influence the information transmitted (Muir, 2013). Numerous radiologists and clinicians have remarked upon the importance of clinicians providing clinical information in diagnostic requisitions, but few have commented upon the effect of the form design on information collection.

To summarize, the x-ray submission form serves to transmit written clinical information from a clinician intimately familiar with the case/patient to a radiologists remote from the case/patient in order to successfully frame the case, or recreate the clinical picture in absentia, for the radiologists (McConnell and Webster, 2010; Loughran, 2004). This, in turn, allows the radiologists to render the best diagnosis in the case connected to the process actually occurring in the patient, termed clinic pathologic correlation, to the best of their ability.

Literature has documented patient demand for x-rays, and other radiological services. In order to change the unwarranted demand for radiographic services by patients, which result in the inappropriate use of x-rays, a multifaceted approach, which includes patients as service users, is required (Larkin, 2003; Finlay and Liddicoat, 2002). This approach requires sound knowledge of factors that may influence patient demand for x-ray examinations. Following the above, there is need to conduct a research with clinicians and radiologist themselves as respondents with the aim of understanding their role of interpersonal communication of x-rays. Thus, investigating and identifying factors that influence clinician-radiologist communications vide the X-ray request form from the clinician's perspective is necessary hence the choice of this research topic.

3.7. Summary

There is limited information about the role of cognitive factors on interpersonal communication in influencing the adequacy of x-ray request form among clinicians in Kenya. Although little literature related to interpersonal communication in x-ray examination, there is a lot on clinician behaviour towards a number of other health-related issues. The literature, as provided above on issues related to individual health-related behaviour towards medical x-rays in particular, provides some form of guideline along which to focus this study. Furthermore, it brought to the fore the fact that medical x-ray services and the factors that prohibit or enhance its utilisation through written communication via x-ray forms remain complex hence the need for this study.

3.8. Research Gaps

There is need to incorporate theory driven approaches in understanding clinical behaviours like in investigating the adequacy of the X-ray request form as a communication tool. Most of the prior studies have utilized clinical audit retrospective methodology to highlight the magnitude of the inadequacy of the x-ray request forms as tools of communication. The literature, as provided above on issues related to individual health-related behaviour towards medical x-rays in particular, provides some form of guideline along which to focus this study. However, medical x-ray services and the factors that prohibit or enhance its utilisation through written communication via x-ray forms need to be established by further research in order to come up with strategies of promoting effective communication between clinicians.

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