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Review Article

Communication of patients and healthcare personnel during the diagnostic radiological process

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Abstract

Communication can be defined as an exchange of information between a sender and a receiver. Communication in medicine fosters the development of a therapeutic relationship. Communication between medical or nursing staff and patients during the process of a radiological diagnostic investigation constitutes a challenge, as the main objective of the procedure is the production of medical images. Communication between patients, doctors and nurses over the course of a radiological procedure can be divided into what takes place before, during, and after the imaging procedure. Communication before the procedure allows the involved parts, to meet, to start the therapeutic relationship, to explain the planned radiological investigation and set the groundwork for safety in the imaging procedure. During the procedure, the supportive role of the healthcare professionals is critical for succeeding in the production of clinically useful images, and to ensure the patient tolerates the investigation. After the procedure, communication aims at relaying the result, as well as supporting and guiding patients accordingly. The development of communication skills by the healthcare professionals is paramount for effective contact with patients in all three phases of the radiological diagnostic process, and should be the result of formal education. Optimal communication practices result in higher patient satisfaction levels, while every healthcare provider should factor-in the cost of achieving quality in communication.

Keywords: Communication, Nursing staff, Physician, Patient, Radiology

Introduction

Communication is defined as "the transmission or exchange of messages and information from an entity regarded as the sender to an entity regarded as the receiver via a common system of signals, symbols, or behavior patterns"[1]. Another definition, which views communication as "mutual contact between people which is characterized by understanding and a spirit of collaboration", is more relevant to the nature and goals of communication in the clinical setting. In this setting, communication aims at promoting and maintaining the health of patients.

Forms of Communication

Communication between people can be distinguished into either verbal or non-verbal. In verbal communication, the message is encoded in words, and transmitted either verbally or in scripture, printed or digital. Interpersonal verbal communication naturally holds a key place during the clinical process, owing to its dynamic character of exchange

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of messages, including information or emotions. Certain authorities hold "para-verbal communication" as a subset of verbal communication. Para-verbal communication refers to the features that characterize the words of spoken language, such as the stressing of words, echoing of words and phrases, or the rate of speech.

In medicine, the written form of verbal speech is mainly applicable in one-way relaying of informative content from health services to patients. In the clinical setting, it enhances the outcome of interpersonal verbal communication in the preparation for a visit to a healthcare provider services, or defines a course of action that needs to be taken after making contact with the healthcare provider. On the other hand, non-verbal communication includes physical contact, the direction of one's body relevant to the other person, the distance kept from the other person, one's posture, eye contact, facial expression, gestures and mannerisms, as well as personal presentation. It is often registered sub-consciously, but has been argued to transmit a message much more powerful than that of verbal communication[2]. Non-verbal communication is very much influenced by cultural factors.

Communication in Medicine

In medicine, communication constitutes the cornerstone of the therapeutic relationship between patient and medical or nursing staff, as it allows the transmission of information, as well as the creation and cultivation of a relationship. The scientific or technical knowledge of healthcare providers does not suffice, and its delivery needs to be complemented by the use of communication skills, to ensure effective application of technical knowledge in the clinical setting. Successful communication between medical, nursing staff and patients has been proven to lead to better therapeutic results[3,4].

The Bi-Directional Character of Communication

In the clinical setting, it is the bidirectional character of communication that allows clinical goal attainment. Although the nature of communication between patient and provider of treatment has always been bidirectional, this two-way character of communication has undergone development over the last few decades owing to the widespread availability of scientific knowledge, brought about by advances in technology. Bidirectional communication has also been aided in its development by the change of clinical model, which has brought the patient to the center of the communication process, as well as by progress made in the field of patients' rights.

Communication Messages Originating from the Patient

In the communication taking place during the clinical process, the patient is the barer of information and messages which define the clinical scenario. These include the patient's symptoms, findings of previous clinical examination and investigations, as well as the patient's thoughts and emotions. For example, feelings of a patient, such as fear or sadness, and processes, such as doubt or denial, may be communicated in verbal and non-verbal ways.

Viewing the clinical problem from the patient's perspective is of great value, as it allows the healthcare provider to more fully define the goals of communication, to respond to as many dimensions of the multifactorial nature of health problems, and, therefore, to attain the best therapeutic result, and optimal patient satisfaction from the healthcare services provided. A consequence of the aforementioned has been the development of "patient-centered radiology", a cultural shift, that is, in the way patients are approached in the radiology department. In this emerging culture, patients partake in a discussion on the radiological investigation in question, they are informed of what it involves in order to offer their consent, and are encouraged, while also respecting their privacy, to express relevant psychosocial dimensions of the health problem they are experiencing. Through this process, patients become receivers of information and counseling care in an open environment of bidirectional interaction between themselves and the medical and nursing staff. Thus, in patient-centered radiology, a relationship is developed in which the target is the patient as a whole. Indeed, it has been shown that the transition to such a model of care improves the health services offered, and increases patient satisfaction[5-7]. As a result, in 2001, the Institute of Medicine in the United States of America pointed to patient-centered and family-centered care as key elements of healthcare services in the 21st century[8].

Content of Communication from the Medical and Nursing Staff

Over the last few decades, the number of radiological examinations, and therefore the number of opportunities for communication during the process of radiological investigation, has dramatically increased. There are numerous factors which can account for this increasing trend of communication opportunities between providers and receivers of healthcare services in the radiology department. These include progress in imaging technology with the development of novel techniques and the improvement of already existing ones, widespread availability of imaging technology at increasing numbers of medical centers, changes in demographic characteristics such as population aging and increases in life expectancy, changes in epidemiological characteristics such as the increase in the number of diagnoses of malignant disease, as well as progress in the treatment of diseases, which improves patient survival and, therefore, the number of radiological reassessments that will be required.

In this context, the role of medical and nursing staff in radiology departments is now closer to the core of patient management, and, therefore, the development of communication skills and optimization of the communication process is unquestionably called for. In appreciation of this,

the Radiological Society of North America (RSNA) launched a campaign whose title "Radiology Cares" reflects one of its objectives, which is developing communication between radiologists and patients[9-12].

Indeed, communication in the radiology department has therapeutic qualities, as it increases the amount of knowledge and improves the awareness of patients regarding their medical condition, it nurtures a sense of confidence in the health services being offered, improves compliance with the management plans set out by health professionals, offers relief to patients through encouraging the expression of thoughts and emotions, improves access to other health services, and empowers patients to problem-solve and partake in the management of their health[4].

Communication in the diagnostic radiological process

Communication during the radiological process has both the characteristics of communication in general, as well as characteristics specific to the process itself. Communicating during the radiological process constitutes a challenge indeed, as the central aim of the process is imaging the patient, and the main product of the process is the image itself. This may potentially lead to the minimization or complete obliteration of any contact of the radiology department staff with the patient. Limiting the communication, in turn, limits the ability to influence the course of the patient's condition, which is the goal of the clinical process. In research conducted in 2004 in 66 healthcare providing units in the United States of America, 80-90% of radiologists did not even meet up with their patients[13]. It is not incidental that radiology has been characterized a medical specialty in which communication is only between doctors[6], meaning the referring physician and the doctor responsible for the imaging. Along the same line, radiology has been the subject of a poignant cartoon in which a patient arriving at a radiologist's office meets a, "No Patients Allowed" sign[14]. A prescient 1977 article in the American Journal of Roentgenology was titled, "The radiologist: doctor's doctor or patient's doctor"[15], while 35 years later, in the title of an article from Stanford University published in the medical journal "Radiology", the radiologist was still dubbed "invisible"[16]. These comments prove to be even more pertinent if we consider how seldom patients choose "*their* radiologist", as opposed to "their gynecologist" or "their urologist", since the choice of radiologist is often that of the referring physician or of the institution in which the patient is being managed[17]. A current shift which has brought the radiologist closer to the core of communication with the patient has been the wider use of imaging services for regular screening purposes such as mammography. In these cases, the results are often relayed from the radiologist directly to the patient without a referring doctor taking part in the process, since the radiological investigative process is initiated by patients themselves, based on the regular intervals of the screening protocol[18].

Communication Prior to the Radiological Investigation

Communication with the aim of setting an appointment for a radiological investigation can be effected either by the patient's physical presence at the department, by telephone call or by digital means of arranging appointments over the internet[19]. Communication with patients at the time they arrive at the department for a radiological investigation starts even before verbal contact with the staff, by the impression that the setting makes on patients. It has been suggested that interpersonal contact of staff with patients should follow the pattern dictated by the "AIDET" acronym, which involves "*Acknowledging*" the presence of the patient and offering explanations for delays that may have occurred, making the necessary "*Introductions*" on both sides and explaining the role of staff involved, offering an estimation of the "*Duration*" of the presence in the department, providing an "*Explanation*" of the procedure that is to follow, and finally "*Thanking*" the patient for their cooperation and their participation in the radiological process[6]. This early stage of the process also allows patients to clarify with staff when the results of investigations will be available, and in what way and form they will be relayed to them, an issue which may be a significant source of stress for patients. This may also be the point of an initial psychosocial assessment of the patient, which may pave the way for effective communication during and after the investigation.

Finally, in this phase of the process, patients may also be asked to provide consent for the procedure planned. Consent may be either verbal or written, depending on relevant protocols or local practices of the healthcare unit[20]. Given that consent, according to international standards, is required to be "*informed*", meaning that it follows an explanation of the procedure and the provision of answers to any questions that may arise, effective communication is key in this interaction between patients and radiologists and nursing staff, as well.

Central to the process of a radiological investigation is the taking of a thorough medical history. This aims at assessing safety issues relevant to the patient during the examination (e.g. possibility of pregnancy in examinations using ionizing radiation, metallic implants in magnetic resonance imaging studies, allergies to contrast media where these are to be used), but also aims at acquiring information which will allow staff to carry the study out more efficiently, and interpret the images produced optimally. Use of questionnaires, available as forms to be filled in by patients, is an alternative way of obtaining useful information, which may act as an adjunct to taking a medical history, and supplements the patient's communication with radiologists and nursing staff.

The stage prior to the radiological investigation also includes studying the patients' records. This allows extracting information which will prove useful in promoting a sense of trust during the examination, as well as facilitating preparation for the ensuing discussion with the patient, which may thus be conducted with the professionalism due. Professionalism is conveyed

by consolidation of the available information and understanding of the medical case at hand, prediction of possible questions which may arise on the side of the patient, preparation of relevant answers, and, therefore, maximization of the therapeutic effect that this contact with the patient may produce.

Trust is at the core of the relationship between patients and medical and nursing staff. Therefore, at the beginning of the interaction with the patient, it is good practice to clarify to the patient that all information that is provided by them is governed by rules of medical confidentiality, the legal framework of which has recently been strengthened by the General Data Protection Regulation (GDPR). The cultivation of a sense of trust opens up the channels of communication during the radiological process.

An important aspect of the communication between patients and radiologists or nursing staff is the provision of information regarding how the actual investigation is performed. The provision of such information may be initiated before the patient's arrival at the department by sending the information to the patient in written form, printed or digital, or by ensuring the information is available to patients on the internet[19]. This can either be on a web-site created by the department, which can act as a resource, or by citing other authoritative locations on the web with the relevant content. An example of such an internet location would be "Radiology Info" (https://www.radiologyinfo.org/), which is a venture launched by the Radiological Society of North America and the American College of Radiology, aiming at offering information to the public, in either English or Spanish, on various radiological investigations available at radiology departments in the United States of America[21]. Information provided prior to an examination should always include any relevant preparation by the patient required before a specific investigation.

As the process progresses, the patient is also verbally informed about what the examination involves in practice. This is started by clarifying what is already known by the patient about the investigation, and followed by a description of the procedure to ensue. Delivery of information should be done in a manner which is respectful of the patients' cognitive ability and language competence, with an effort to avoid medical jargon which hinders understanding of what is being explained.

The stage prior to the radiological investigation allows patients to voice any concerns relevant to the examination, such as whether they will be exposed and to what degree to ionizing radiation, or whether the investigation will be painful or not. Providing the patient with information on sensory parameters of a specific procedure contributes to reducing anxiety prior to an examination[6], to increasing patient cooperation during the test, and to registering greater patient satisfaction of the healthcare services received.

Communication during the radiological investigation

Communication between the patient and medical and nursing staff and radiology technicians during the radiological investigation is easily affected these days given the availability of modern technology and automated systems. And, indeed, communication during the examination may significantly influence the way the patient feels during the procedure, as well as the quality of the images produced, given that dynamic contact reduces levels of patient stress (for instance during magnetic resonance imaging), and facilitates keeping the patient motionless. This allows swifter completion of the investigation and the acquisition of better-quality images[8].

Communication is of paramount importance in radiological investigations involving direct contact between doctor and patient, such as in ultrasound imaging. During such examinations, the doctor constantly communicates with the patient either verbally or non-verbally, and, therefore, physicians should behave accordingly. The radiologist should not allow external sources of interruption, such as the telephone ringing, and should place the appropriate emphasis on the patient's privacy and dignity. It should be remembered that the doctor should be communicating with the patient and not the imaging screen. This is because any reaction, verbal or non-verbal, to findings during the investigation is registered by the patient, and, therefore, constitutes an element of communication with them. The physician's behavior should follow the principles of the therapeutic relationship it serves, and limit itself to a bi-directional exchange of messages with the patient, avoiding triangulation of the relation which would include the screen. When the relation is triangulated the degree of stress experienced by the patient increases[22], and patient satisfaction from healthcare services received decreases.

During any radiological procedure, the behavior of doctors and nursing staff should convey messages of interest and support to the patient. Radiology department staff should be constantly communicating with their patients during the procedure, confirming their tolerance of the investigation underway, assessing their emotional status, offering warning of any sensory stimuli (such as pressure or noise) that may follow, informing patients of the remaining duration of the investigation, and encouraging them to continue with and complete the examination. Such behaviors on the side of clinicians increase patient compliance with the plan of investigation and reassessment of their condition, and, therefore, constitute an integral part of the therapeutic process.

Communication after the radiological investigation

The degree of radiologists' communication with their patients after a radiological investigation often depends on

the exact radiological modality involved and the indication for the examination. For instance, contrary to clinicians working in the fields of interventional radiology, ultrasound, or mammography, their colleagues working principally in computerized tomography or magnetic resonance imaging rarely communicate with patients after an investigation[23].

Communication after a radiological investigation focuses mainly, but not exclusively, on conveying the result of the imaging. While some research has shown that patients prefer to be informed of the results of their investigations from the referring physician, who is following up their condition[24,25], other pieces of evidence indicate that patients are often interested in communicating with the radiologist involved in the examination[8,26,27]. To a certain extent, a preference to obtain the results from the referring physician is explained by the familiarity patients may have with their referring doctor, and the therapeutic relationship which may already be in place. What is more, referring clinicians are often chosen by patients themselves, as opposed to radiologists who are often randomly assigned, or are the choice of the referring doctor. In research which has shown the patients' preference to be for the referring physician to convey investigation results, this preference may, in part, be explained by the fact that a substantial percentage of patients are unaware that radiologists are doctors[23,25,28]. This percentage has been shown to be as high as 55-60% in certain study populations[29]. The likelihood that a patient may be interested in consulting with the radiologist may depend on such factors as the age of the patient, with younger patients more commonly requesting communication, or the level of education of the patient, with the more highly educated patients more frequently requesting contact with the radiologist[30]. It has also been shown that communicating with the radiologist shortly after an investigation in order to be informed of the results may reduce the stress experienced by patients who would, otherwise, have to wait in order to contact the referring physician, and be informed of the results a number of days later[31]. To conclude, patients' preferences regarding who conveys the results of radiological investigations are not clear, and this can be attributed to various factors, including the natural heterogeneity of the preference, as well as differences in how the study questions are worded, differences in study populations, and also differences in the methodology of statistical analysis between various pieces of research.

However, the question of who makes the results available to the patient should also be asked from the perspective of the radiologist. This is because trends are unclear in the specialty as a whole regarding the willfulness or competence of radiology clinicians to convey investigation results[32]. There is no doubt that a more central position of radiologists in the process of informing patients of their results helps in highlighting the clinical role of the specialty, and offers added service to the main objective of promoting the health of the patient by strengthening a doctor-patient relationship[29,30]. A potential intent of radiologists to make their clinical contribution more central to the management of patients could be translated into instituting regular radiology outpatient department clinics. In these, patients could benefit from a presentation of their images[33], which as the popular saying goes "are worth a thousand words", and could be offered the opportunity to discuss the results of their investigations with radiologists. This would improve recognizability of these clinicians as members of the medical team caring for patients. By contrast to the above direction of activity, it is common for radiologists to use Picture Archiving and Communication Systems (PACS) and tele-radiology, by way of which they offer their image interpretation services without being visible to the patient, and without even being required to be physically present in the healthcare unit where the investigation is being carried out[16]. Clearly, direct communication between patients and radiologists to discuss investigation results leads to loss of time allocated to the diagnostic interpretation of images, and to an increased workload on clinicians of a specialty which is under threat of occupational burnout[34,35]. Such communication also demands a multitude of organizational and logistical interventions and changes in the workplace, including closer contact with referring physicians to ensure resonance on the management of imaging findings[25]. Finally, on the subject of preparedness of radiologists to convey the results of investigations to patients, it is important to note that numerous court decisions which have been published in the literature point to a professional and legal obligation of radiologists to communicate the results of investigations directly to their patients[36].

With respect to the written report of radiological investigations, this is nearly always available not only to the referring physician but to the patient as well, and it is often the only element of communication between the radiologist and the patient. The written report is nowadays read by patients too, as they are more centrally placed in the management of their health conditions. The report should be accurate in its content, phrased in a way that is comprehensible, and, from a professional point of view, should be rigorously screened for the way it is presented, as it is always also judged on its layout, wording, grammar and syntactic structure[8]. The content of written reports of radiological investigations is usually standardized as to the information conveyed and the way it is communicated, with little regard to who is the patient-receiver, as the radiologist is only rarely cognizant of the social background of the patient being investigated[33,37]. In such cases where there is no referring physician acting as intermediary between patients and radiologists, such as in regular secondary prevention radiological investigations, in which the recipients of the results are often the patients themselves, the report handed to them may be worded in a way that would be comprehended by lay people. The availability of such a service would naturally add to the workload of a radiology department, which would have

to produce two different written reports, one in layman's wording and one in formal medical terms[29,38]. For example, the Mammography Quality Standards Act (MQSA) of the United States of America indicates that healthcare providers are required to send a written summary of the report to the patient, in a language that is understandable by the general public, within thirty days of the investigation[29]. As interpersonal communication between radiologist and patient is often limited, the need for exactness and clarity in the phrasing of this report becomes imperative.

Irrespective of whether a radiological investigation is indicated for the assessment of symptoms, or for prevention, or regular follow-up after cure of a disease, the emotional load that may be brought to the department by the patient is often significant. Therefore, communication after the investigation for the delivery of the diagnosis requires specialized communication skills. These include the ability to convey the result in such a way that this can be comprehended, avoiding technical terms that mean little to the patient and pay little service to the interaction. Radiologists should, at this stage, also assess the general appreciation that patients have of their medical problem, and relevant misunderstandings should be addressed. It is of primary importance that the patients' emotional response to the delivery of a result is noted, and responded to appropriately. Potential management difficulties relating to the diagnosis should be highlighted, and realistic solutions suggested. A sense of encouragement, motivation and hope despite the implications of the investigation result should be fostered.

In no other scenario are the communication skills of radiologists and nursing staff of greater significance than in breaking bad news after a radiological investigation, especially so if the result is unexpected. Patients' usual reactions in such cases are those of surprise, denial, fear, anger or even guilt[39]. It is common for patients not to register the remainder of a discussion with medical and nursing staff after having been informed of the detection of a malignancy[6]. In spite of this, patients intensely recall, for long periods after the event, the particular moment and the way the bad news was delivered.

Employing a skillful approach to breaking bad news improves the ability of patients to manage their disease and handle the implications of it[39]. The emotional load of such a moment acts as a hindrance to communication, and requires special competencies in order for those messages necessary for the further management of the patient's health problem to be communicated. Therefore, it is imperative that every radiology department formulates a management protocol for dealing with this scenario[40]. Setting up the appropriate communication space and ensuring time availability for the expression of emotions, selecting the members of staff who will take part in the discussion, suitably preparing all essential information from medical records, and clarifying what is already known by patients about their condition and what is being investigated, all formulate the framework in which supportive contact with the patient can be effected. Following that, patients are probed as to the degree to which they wish their imaging findings to be detailed, and the results are delivered in a language comprehensible to the patient, oftentimes after a verbal warning that the news that will ensue are not as would be wanted. Deployment of skills of empathy and active listening, the, at regular intervals, productive use of silence to allow registering of the message, and the coalitional use of family members to the degree allowed by the patient, are all necessary in the management of the patient, who is, at that time, inundated by thoughts and emotions. Radiologists and nurses involved should, once again at regular intervals, discreetly assess the degree of understanding by the patient of what has already been said. This helps with determining the pace at which the discussion can continue, and aids at assessing the need for the patient's environment to become involved in the management. Throughout this process, radiology clinicians and nurses should be truthful about the diagnosis, should dynamically monitor the patient for any signals that may point to how much information they are willing to be given, and should avoid false reassurances in cases where the prognosis is not clear. At the same time, they should create an outlook of manageability of the circumstances given the diagnosis, and help in practically formulating a course of action, including the next steps that need to be taken by the patient. The latter should also be informed of the availability of other sources of support (such as patients' associations, groups and organizations). It is necessary to allow time for questions that may arise progressively during the discussion, as the initial reaction settles down[39-48].

All the above elements of a competent approach to breaking bad news constitute challenges in this demanding interaction that radiologists and nursing staff may have to engage in with patients. Especially so given that most members of staff of radiological departments do not generally receive specialized training in patient communication skills[39]. However, societies and cultures progress, and with them the expectations of patients increase, making a change of mindset in healthcare providers and the institution of training in communication with patients imperative[22]. This would also include training in specific clinical scenarios such as in breaking bad news.

Obstacles to communication

The degree of difficulty in the process described above may indeed be increased by obstacles to communication. This may refer to obstacles pertaining to either the providers or the receivers of healthcare services, and may include[47,49,50].

- Limited available time for communication
- Inappropriate setting for communication to take place in
- Lacks in the training in interpersonal communication of healthcare providers
- Language obstacles

- Cultural obstacles such as religious obstacles, ethnic or racial prejudices or obstacles relating to gender or age
- Cognitive obstacles including limited cognitive ability or medical conditions such as dementia
- Obstacles relating to the patient's psychological or mental state such as emotions (fear, surprise, anxiety, grief, anger), personality traits or psychiatric conditions
- Obstacles of physical experiences such as pain in patients or fatigue in healthcare providers
- Financial obstacles, which, in the highly competitive healthcare services' market, often, by necessity, lead to the provision of services to as high a volume of patients at as low a cost as possible, which inevitably puts the quality of communication at risk[30].

Improvement in communication

The systematic development of communication skills is fundamental in improving and attaining optimal communication between patients and medical and nursing staff during the radiological process. By extension, this also applies to overcoming obstacles in the process, which were detailed previously.

Communication skills to be developed include the ability on the side of radiologists and nursing staff to create the appropriate setting for contact with patients, as well as to maintain an open attitude towards the patient, which fosters the bidirectional exchange of messages and signals. This should be done in a way that is respectful to the patients' cognitive, cultural and other characteristics. Such skills also include the ability to communicate technical issues in a way that is comprehensible, and repeating what has been said in alternative ways when this has not been understood. Radiologists and nurses should develop skills of attentive listening, which demonstrates interest to the patient, as well as empathy, which indicates viewing the health problem at hand from the patient's perspective. The cultivation of such skills also allows staff to create a sense of perspective for the patient, by formulating an action plan, while at the same time maintaining awareness of, responding to, and modulating the non-verbal elements of the interaction, in a way that will be to the benefit of the patient.

Initiation of development of such skills should be during graduate training of healthcare providers, which demands a patient-centered and holistic orientation of training programs. It is, however, a process of lifelong learning and acquisition of experience, which translates into continuous improvement of communication skills, and a progressive increase in the contribution to the therapeutic result for patients and their satisfaction from the services provided. A process, that is, which distances radiology department staff from older paternalistic practices, and embraces newer trends in the healthcare services market, of joint decision-making between patients and medical and nursing staff in the management of health issues[51].

Communication in medicine and nursing is an art. In order to be learned, it demands, other than practical attendance and observation in the clinical setting, a specific training program which systematizes and passes a whole body of knowledge on in an applicable way. At the same time, such a program should make provisions for the assessment of the results of the trainee and of the training curriculum, in order to ensure their respective continuous improvement. It is now standard practice that the quality of medical study programs in the United States of America, as judged by the Accreditation Council for Graduate Medical Education (ACGME), is also evaluated on its content of training in the areas of communication and interpersonal skills[51,52]. Despite that, in a 2017 article in the Journal of the American college of Radiology, the authors reported that, to their knowledge, there was no training program of specializing in radiology which both trained and assessed candidates in the skills of communication[53]. Such a program is clearly of particular value in a specialty which has, at times, been chosen by doctors specifically because it doesn't demand regular contact with patients.

Improvement in communication may also be brought about by the publication of internationally accepted guidelines, which set out the parameters of optimal communication, so as to act as a reference guide, as well as an assessment tool, of the quality of communication between patients and clinicians or nursing staff during the radiological process[20].

Communication in cases of medical malpractice

The value of developing communication skills is especially emphasized in cases where the subject matter of communication is a medical error. The primary objective in such cases is the restoration of trust which has, ipso facto, been compromised, aiming, principally, at a therapeutic benefit for the patient, and secondarily at the management of the error from a professional point of view. It is important to note that radiologists called upon to manage medical errors of theirs are at a disadvantageous position compared to colleagues of other specialties. This is because it is quite common for radiologists to never have met with the patient whom the error involved, so as to have had an opportunity to build a personal relationship with them, the qualities of which are often important in managing a crisis.

Communication in cases of medical malpractice should be based on honesty and an open attitude in the exchange of views. The onus of communication from the medical point of view falls on the attending radiologist and other members of staff directly involved in the error. From an administrative point of view, the onus falls on the head of the radiology department, administrative staff of the institution and clinical risk managers. The content of what is communicated should include the admission that an error has been made, the circumstances that led to the error happening, the consequences of the medical error, and all measures taken to remedy the situation[6,54].

All the elements that make up optimal communication between patients and radiologists or nursing staff need to be in place in this clinical scenario as well, including offering the patient the opportunity for unhindered expression of emotions, in acknowledgement of the fact that a medical error does not merely constitute a technical mistake. It is an unexpected development that may potentially have consequences for the patient, who could be affected physically, mentally, or socially.

The impact of communication on patient satfisfaction

The positive impact that communication of good quality during the radiological diagnostic process has on patient satisfaction has been proven by relevant research[52]. Indeed, the significant contribution of radiology services to the whole range of medical specialties renders the radiology department instrumental to the satisfaction of patients from medical services provided as a whole[8].

Patient satisfaction studies are primarily based on questionnaires that involve subjective evaluations and not objective measureable data. Research conducted by the radiology department at the MD Anderson Cancer Centre in Houston, Texas showed that the most important factors contributing to satisfaction of patients who visited their department was acknowledgement of and response to their concerns, a sense of being treated with respect, and a feeling of being viewed as people and not as numbers[55]. The common denominator of all the above evaluation parameters used by patients is the skill of communication, signifying that this is the core instrument in achieving patient satisfaction of healthcare services offered.

Lack of contact of radiologists and nursing staff with the patient during the radiological process makes an appraisal by the patient of the, potentially very skillful, imaging services received very difficult. This is because patients often relate their satisfaction more to the interpersonal exchange they experience during the radiological process and less to the quality of the imaging produced or the accuracy of its interpretation[17], which are expected by patients to, by default, be professionally competent[5]. Empathy, a core element of communication, is consistently recognized as a factor which correlates with patient satisfaction of received healthcare services[52,56]. It has been shown that even the inclusion of the photograph of the patient being imaged in the medical file helps in the development of empathy by radiologists[57], and, therefore, in the improvement of communication and a consequent increase in patients' satisfaction from services provided by their doctor.

It should not be overlooked that, in many countries, the degree of patient satisfaction of services received translates into additional funding for the said services, constituting a motive for their improvement[8,52,58].

The cost of communication

"Talk isn't cheap", as maintained in articles in radiology journals[30,58], referring to the view that, in recent years, radiological investigations have often assumed characteristics of medical products in an industrial production line. In this view, the efficiency of the staff and the return on investment are strongly factored into the financial viability of a radiology department, and operate in inverse effect to the need for communication between radiologist and patient. The actuality of this is determined mainly by reimbursement conditions of private insurance companies and social security funds, which cover the costs of performing the imaging and interpreting the resultant images without taking into account and covering the costs to the radiologist and the department of time spent in communicating with patients. Thus, a disincentive is created for contact between patients and medical or nursing staff[16]. However, as examples are numerous in the medical literature of the correlation between a better outcome for a condition when communication with healthcare providers is improved, it is possible that, in the future, research data will lead to the reimbursement, by insurance policies, of the cost of communication between the staff of radiology departments and the patient[33]. Should this indeed happen, the financial framework will have been set up for the enhancement of the therapeutic relationship in the radiology department, to the benefit of patients.

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