

IMPACT OF COMMUNICATION IN HEALTHCARE: MEDICAL IMAGING AND RADIOTHERAPY PERCEPTIONS

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ABSTRACT

Background: Currently, establishing proper human interaction is essential for the integrity and synergy of any organised system. Promoting advanced communication skills has become a pressing priority in all professional sectors, especially in healthcare. **Objectives:** To assess the perceived importance of health communication skills (HCS) among first- and fourth-year Medical Imaging and Radiation Therapy (MIR) students and MIR healthcare professionals. **Methodology:** The sample was composed by 31 first-year students, 30 fourth-year students, and 30 MIR professionals. Participants completed a questionnaire adapted from the HCS curriculum for healthcare professionals, which addresses the importance of HCS on a Likert scale. **Results:** First-year students revealed that they cared more about the HCS of active listening, empathetic listening, eye contact, empathy and respect, emotional support, facial expressions, and tone of voice ($p \leq 0.05$) compared to fourth-year students and healthcare professionals, who did not show statistically significant differences between themselves. **Conclusions:** Given this devaluation of the importance of HCS throughout academic graduation and in the transition to the professional environment, it is necessary to develop adapted and person-centred communication in order to promote quality, satisfaction, and safety in healthcare.

Keywords: Health Communication, Person-Centred Care, Quality Healthcare, Patient Satisfaction, Safety.

1. INTRODUCTION

While acknowledging the significant impact of technological advancements, digital evolution, and artificial intelligence on human life, investments in interpersonal relationships should not be overlooked, as they are essential human values. Therefore, the importance of communication skills in healthcare becomes undeniable, as they optimize and humanize the interpersonal relationships inherent in healthcare services, particularly between patients and healthcare professionals (Arcega *et al.*, 2020).

In healthcare, particularly when facing suffering, the possibility of loss, and the need for medical assistance, human beings become more vulnerable, highlighting the importance of communication, empathy, compassion, and other humanistic skills. This context of fragility constitutes one of the targets for healing, along with the undesirable condition of biological illness. However, for this to occur, all healthcare professionals, from medical and nursing to diagnostic and therapeutic areas, must resort to personalized, person-centered care and the development of health communication skills that lead to an effective response to these humanistic

needs, emphasizing the holistic view that the user is not only the disease they have, but their entire bio-psycho-social context (Nordgren & Fridlund, 2001; Stavropoulou *et al.*, 2022).

From a technical standpoint in healthcare communication, it is imperative to develop verbal and nonverbal communication skills that, when interconnected, allow professionals to practice personalized interaction with the patient. Verbal communication encompasses competencies related to the healthcare professional's welcoming attitude, namely, their introduction including name and professional category. It also includes gathering information through asking open, closed, dichotomous, and non-suggestive questions. Conducting an associative anamnesis process, relating personal information to the clinical picture, while maintaining assertive, clear, and positive language centered on the person, is crucial. The patient should be addressed by their name, thus guaranteeing their individuality and being treated with respect and dignity. Explanations should be given using short sentences, simple terms, and objective content. Avoid infantilizing discourse, adapt volume, tone, and rhythm of speech, and use pauses and silences to facilitate the assimilation of information (Coriolano-Marinus *et al.*, 2014; Sequeira, 2016).

Nonverbal communication encompasses skills that facilitate the understanding and transmission of verbal communication itself. These skills are related to rapport (body language and mirroring), active listening and elements of passive listening, using gestures to promote fluency in speech, adapting facial expressions to the circumstance, ensuring personalised closeness to the person, establishing eye contact, positioning oneself optimally to promote the relationship, and facilitating touch (Rehman & Sohail, 2023; Sequeira, 2016).

Beyond acquiring this knowledge, skills, and abilities, it is also important to articulate several fundamental human attitudes and values for providing person-centred healthcare, such as inclusion, tolerance and impartiality, a culture of honesty, principles of confidentiality, privacy, and respect for intimacy. In this way, the humanistic nature of healthcare is established, translating this knowledge, know-how, and professionalism into work practices (Evanson, 2024; Rehman & Sohail, 2023).

These attitudes of social responsibility and therapeutic alliance increase user understanding and collaboration, promote trust, comfort, and safety in health services, and reduce clinical errors, contributing to better health outcomes (Evanson, 2024).

Several recent studies reveal the impact of communication on health indicators, specifically indicating dysfunctional communication as the cause of 10-13% of safety incidents with patients and as the cause of 20-25% of adverse health errors, as a result of the study by Keshtkar *et al.* (2025). Also, the study by Coyne & Dieperink (2025) reports that 27% of hospital readmissions are due to misunderstandings regarding post-hospital care information. Furthermore, the report "Inadequate Hand-Off Communication - A Complimentary Publication of the Joint Commission Issue 58" attributes 30% of errors resulting in serious injury or death to communication failures, citing the American reality as an example, where in 5 years, communication failures were responsible for more than 1,500 deaths and approximately \$1.7 billion in associated costs (Joint Commission & Alert Event, 2017).

From the patient's direct point of view, the Patient Safety Organisation study reveals that approximately 55% of patients who did not feel concerned about their health status from professionals reported an increase in symptoms (Stoltzfus, 2025), and most complaints and grievances in the health sector result from communication errors (Anderson, 2019).

Thus, evidence-based medicine has been demonstrating that the higher the quality of communication, the greater the protection for the patient, the better the health outcomes, and the

lower the costs of services that can be reused by health institutions and applied to other aspects (Ratna, 2019).

In the current scenario, it is not enough to improve communication skills, the undergraduate and continuing education of professionals in the health field must be proportional to their awareness and motivation for these humanistic aspects.

Therefore, given the communication challenges in the field of healthcare, considering its value in the quality of human interaction and its influence on health indicators, this study emerged with the objectives of evaluating the perception of the importance of communication skills among 1st and 4th year Medical Imaging and Radiotherapy (MIR) students and MIR healthcare professionals in the diagnostic and therapeutic areas, namely, Radiographers, Therapeutic Radiographers, and Nuclear Medicine Radiographers.

2. MATERIALS AND METHODS

The study design is cross-sectional, observational, and obtained ethical approval (93_CEIPC_2023) for its implementation.

The sample, obtained by convenience, voluntarily and anonymously, was composed of 31 first-year MIR students, 30 fourth-year MIR students, and 30 professionals from MIR areas. Of the 91 participants, 76.9% (n=70) were female and 23.1% (n=21) were male, with a mean age of 27 years old (SD=13.26), a minimum age of 17, and a maximum age of 62 years old. Participants completed a questionnaire adapted from the Health Communication Skills Curriculum – “A European consensus on learning objectives for a core communication curriculum in health care professions” (Bachmann *et al.*, 2013). The adaptation consisted of assessing the perception of the importance of communication skills, and was duly authorised by the authors. The questionnaire is self-administered using a 1-5 Likert scale, corresponding to 1- Not Important at all, 2- Somewhat Important, 3- Important, 4- Very Important, and 5- Extremely Important. It contains 14 questions that assess participants' perception of the importance of health communication skills in interacting with patients, as mentioned below:

- 1- You consider it important to greet the patient when they enter the room and introduce yourself.
- 2- You consider it important to explain the procedure to the patient, using accessible and clear language, and to see if they understand.
- 3- You consider it important to ask the patient if they have any questions about the exam they will undergo and, if so, address their uncertainties.
- 4- You consider it important to pay attention to the information the patient conveys, from the content to the tone of voice.
- 5- You consider it significant to remain silent and not interrupt the patient while they are expressing themselves.
- 6- You consider it relevant to establish eye contact with the patient while interacting with them.
- 7- You consider it important to demonstrate empathy and respect for the patient's concerns and feelings.
- 8- You consider it relevant to reassure the patient about their anxieties and emotions.
- 9- You consider it important to demonstrate optimism and hope to patients using the services.
- 10- You consider it important to adopt a professional attitude towards patients.

- 11- Do you consider it important to control the expressions shown to the patient, in order to alleviate any concerns the patient may have?
- 12- Do you consider it important to use an appropriate tone of voice and speech for the patient?
- 13- Do you consider that the distance between the professional and the patient influences the quality of communication?
- 14- Do you consider it important pay attention to the patient and have proper manners when saying goodbye?

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) v. 29 software, where descriptive statistics and non-parametric Kruskal-Wallis tests were used to study whether there were differences between the groups in the perception of the importance of HCS. These differences were detailed by pairwise comparisons to identify which groups differed from each other, and a Bonferroni adjustment was performed to avoid type I errors. The significance level imposed was 95%.

3. RESULTS

In the Kruskal-Wallis test analysis, differences were found between the groups in the perception of the importance of HCS, in questions Q1, Q3, Q4, Q5, Q6, Q7, Q8, Q11 and Q12, as shown in table 1.

Table 1: Results from Kruskal-wallis test and pair-wise comparisons test (*p*) with a Bonferroni adjustment (*Adj.p*)

Question	Kruskal-wallis test		Pair-wise comparisons test					
	<i>P</i>	Test value (<i>H</i>)	1 st year/ 4 th year		1 st year/ MIR Professionals		4 th year/ MIR Professionals	
			<i>p</i>	<i>Adj. p</i>	<i>p</i>	<i>Adj. p</i>	<i>p</i>	<i>Adj. p</i>
Q1	0.015	8.370	.008	.024	.021	.063	.730	1.000
Q2	0.072	5.269	.118	.355	.026	.077	.505	1.000
Q3	0.024	7.485	.090	.270	.007	.021	.317	.951
Q4	0.004	11.107	.010	.029	.002	.006	.606	1.000
Q5	0.001	13.382	.005	.015	.001	.002	.551	1.000
Q6	0.002	12.803	.001	.002	.010	.030	.0402	1.000
Q7	0.004	11.308	.005	.015	.003	.008	.846	1.000
Q8	0.005	10.666	.006	.019	.004	.011	.856	1.000
Q9	0.481	1.464	.685	1.000	.229	.686	.478	1.000
Q10	0.807	0.428	.668	1.000	.521	1.000	.833	1.000
Q11	<0.001	20.349	.015	.046	< .001	< .001	.039	.118
Q12	0.001	13.768	.001	.004	.001	.004	.985	1.000
Q13	0.063	5.543	.044	.133	.040	.120	.965	1.000
Q14	0.179	3.440	.119	.357	.101	.302	.935	1.000

These differences were studied to distinguish which groups varied statistically from each other, and the results showed that the group of 1st-year students, compared to the group of 4th-year students, considers the HCS identified in questions Q1, Q4, Q5, Q6, Q7, Q8, Q11, and Q12 to be more important. This reveals the first result: that the importance of communication tends to decrease throughout undergraduate studies.

In the comparison between the group of 1st-year students and the group of MIR professionals, a similarity is observed between the group of 4th-year students and MIR professionals, with differences in perception in the same questions (Q4, Q6, Q7, Q8, Q11 and Q12), with the exception only of question Q1 and the addition of question Q3.

This similarity between the group of 4th-year students and MIR professionals is also seen in the comparison between these two groups, where there are no statistically significant differences in the perception of the importance of communication in health, identifying equal values of perceptions.

4. DISCUSSION

Based on the results obtained, it is observed that the group of 4th-year students and MIR professionals share similar perceptions regarding the undervaluation of the importance of communication skills in healthcare, compared to 1st-year students. This is due to the fact that in the 4th year, students are exclusively in a hospital environment, carrying out their clinical internships, in the same work environment as healthcare professionals. It is noted that first-year students engage with curricular modules that address humanistic themes such as patient interaction and communication in healthcare, and for this reason they also demonstrate higher levels of perception regarding communication. As we can see in questions Q4, Q5, Q6, Q7, Q8, Q11, and Q12, the perception of 1st-year students was significantly higher, these questions being related to, respectively, active listening, empathetic listening, eye contact, empathy and respect, emotional support, facial expressions, and finally, tone of voice. The fact that 4th-year students have contact with professional practice during their internships allows them to have another perspective on healthcare (closer to the perception of MIR professionals), including aspects related to work overload, accelerated routines, and contact with vulnerable contexts, elements that negatively influence the applicability of communication skills and, in turn, call into question the safety and quality of healthcare. Therefore, there should be a reinforcement, in the final years of graduation, of various humanistic aspects, such as communication skills in healthcare. Thus, when students come into contact with professional environments, they would not disregard interpersonal relationships and would demonstrate more of the humanistic nature of healthcare.

In question Q1, related to presentation and courtesy, there is a difference only between the groups of 1st-year students and 4th-year students, with no differences between these two groups and the group of MIR professionals. In question Q3, associated with openness to clarifying doubts and exploring patients' uncertainties, 1st-year students demonstrate significantly higher values regarding the importance of this competence compared to professionals. However, when compared to 4th-year students, although lower, the perception of this competence does not differ statistically or proportionally. Therefore, despite the professional context, there is a greater concern with patients' doubts, uncertainties, and clarifications among MIR students compared to professionals.

This data suggests that to meet the high human flow in demand for healthcare, a "natural" automation occurs, coupled with the pressure that prevails in hospital environments, and that in

professional practice, there is little time to carry out detailed and clarifying analyses of all patient doubts.

The study results demonstrate that at the beginning of academic training, the perception of the importance of communication in health is higher. These results are consistent with the most recent research in the field of MIR, as demonstrated by Hensley (2020), where the importance of communication in health increases with its integration into work environments through clinical advancements. It is therefore imperative to reflect on this devaluation of communication that occurs throughout training and professional practice, and to find solutions to mitigate this gap, which can lead to diagnostic errors, interfere with the safety and comfort of patients, and even change the humanistic nature of health professionals in favour of mechanisation.

Several factors influence the proper application of communication in healthcare, namely, the occupational stress of work practice and compassion fatigue experienced by MIR professionals in constant interaction with patients in suffering (Robertson *et al.*, 2022). Also, the focus of care centered on the handling and operation of technological equipment and technical actions related to the optimization of radiodiagnosis and radiotherapy parameters, elements that are undeniably fundamental in the competency profile of MIR professionals, but which must be carefully considered so that humanization, an inseparable pillar of healthcare, is not discarded.

Other areas of health sciences also show similar results, such as in medicine (Howick *et al.*, 2023; Neumann *et al.*, 2011), evidencing a decline in communication and empathy throughout medical training and, as in the reality of MIR, the justifications are related to contact with the hospital environment, the increasingly stressful workload, the increasing emphasis on productivity, and the prioritization of complex biomedical and technological knowledge, elements evidenced by Howick *et al.* (2024) as constituting the hidden empathic curriculum in the mapping of healthcare. In this sense, it is suggested that future research should adopt strategies to achieve personalised, dignified, and person-centred interactions. According to Carr *et al.* (2021), in their evaluation of humanisation programs in healthcare, perspective-taking, reflexivity, self-reflection, and person-centred communication approaches are the most commonly used methodologies for developing humanistic competencies in healthcare professionals.

The application of reflective actions focused on person-centred care, as argued by Karnieli-Miller (2020), and of transformative actions presented for the development of communication skills are methods that reduce dysfunctional, inappropriate, and mechanised communication (Kelly *et al.*, 2019; Tan *et al.*, 2021).

The research and education sectors must work hand in hand with the health sector to meet educational needs and direct training towards the current realities of health services, investing in undergraduate and continuing education. From a humanistic point of view, medical care requires person-centred approaches, where the focus on "curing" the disease must be shared with "caring" for the sick person (Coulter & Oldham, 2016). But this person-centred model should not forget the importance of caring for those who "care", and for this, health professionals must also be protected and trained to deal with the factors that hinder and jeopardise their work. Only in this way can the individuality of patients be accounted for (needs, purposes, values and ideas, family and psychosocial context), only in this way can they be treated with dignity and respect, educated for self-determination, and considered individual needs and opportunities promoted (Coulter & Oldham, 2016; Leppin *et al.*, 2017). And, only in this way does the caregiver's overriding commitment acknowledge the vulnerability and act with responsibility and therapeutic alliance. In this sense, including these premises of person-centred care, it is recommended that undergraduate students increasingly engage in hospital settings at an earlier age, in order to allow

contact with future professional practice, fostering critical thinking and building their humanistic competency profile throughout their training. It is also suggested that students engage with programmatic and curricular content on health communication in the final years of their undergraduate studies to reinforce and consolidate their learning on humanistic aspects. And research must be conducted on the training needs of healthcare professionals currently working in hospitals to guide the creation of continuing education programs that enable the updating of knowledge focused on these humanistic needs. Along these lines of thought, the provision of healthcare can benefit from the partnership between communication, education, and support, complementing human interaction with principles of patient empowerment, shared decision-making, health literacy, and individual health management (Leppin *et al.*, 2017), contributing to improved health outcomes, increased protection, safety and patient satisfaction, and reduced medical errors and associated costs, promoting the sustainability of health services.

5. CONCLUSIONS

In conclusion, it is as urgent as it is necessary to raise awareness among MIR professionals, about the importance of health communication. Similarly, it is suggested that methodologies focused on humanisation be adopted in undergraduate training and that continuing education be promoted as a strategy to maintain and develop skills, competencies, attitudes, and values of human communication that dignify care and ensure quality and safety in the performance of diagnostic and therapeutic procedures.

Therefore, it is imperative that in this era of technological evolution, where mechanisation and productivity predominate, healthcare professionals, in their caregiving activities, do not make the needs and concerns of patients invisible, but rather ensure personalised communication and person-centred healthcare.

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