Sociodemographic determinants of knowledge on the figure of radiologist: results of a survey in a large university hospital

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ABSTRACT

BACKGROUND: Despite overlaying an irreplaceable role as a key diagnostic tool in modern medicine, the role of radiologist still appears to be unclear to patients.

METHODS: We conducted a survey in outpatient clinic of Radiological Sciences Department of the University Hospital "A. Gemelli" in Rome, aiming to assess how correctly patients identify the figure of the radiologist. The patients were interviewed by the trained physician using structured questionnaire.

RESULTS: We included the number of 259 patients. Majority were female 63.3%, most were 60-69 years old (24.3%), have finished second grade secondary school (35.1%) and were subjected to magnetic resonance (28.6%) while the least were subjected to mammography (8.1%). Only 38.7% answered correctly to question No 1 *"Who performed your examination?"*, and only 30.9% correctly identified the radiologist as a person interpreting the exam (question No 2 *"Who is going to interpret your radiological examination?"*). Overall, 16.8% responded correctly to the both questions. Significantly less patients with primary school (OR: 0.18, CI 95% 0.06-0.49) and first grade secondary school (OR: 0.37, CI 95% 0.18-0.75) correctly addressed the question No 1 in compare to those with second grade secondary school. The first grade secondary education (OR: 0.43, CI 95% 0.20-0.92) was inversely associated with correct answer to question No 2. Patients with primary education were significantly less prone to give both correct answers (OR: 0.12, CI 95% 0.02-0.60).

CONCLUSION: We report insufficient knowledge among patients on radiologist's role in healthcare system. The level of knowledge is associated with level of education.

Key words: survey, knowledge, radiologist

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INTRODUCTION

The professional figure of the radiologist differs from the typical role of the physician, in many aspects. While in the past the role of imaging was to confirm the diagnosis and stage the development of the disease, supporting the physician and supplementing clinical examination, nowadays anticipating the diagnosis during a asymptomatic or preclinical phase has became much more prominent [1]. With the increased demand for image-guided procedures, radiology is replacing many interventions previously provided by surgeons and physicians and today's radiologist have frequent contact with patients [2]. However, despite overlaying an irreplaceable role as a key diagnostic tool in modern medicine, the role of radiologist is still unclear in the eyes of patients.

Because of the large increase in number of examinations, the time of a direct interaction between radiologist and the patient is drastically reduced, and radiologists often use the report as the only way of communication [3,4]. Furthermore, the relationship between radiologist and patient is very often mediated by the radiographer and the radiology nurse. A 2008 survey by American College of Radiology revealed that 50% of Americans did not know if a radiologist interpreted scans or only performed them [5]. The misunderstanding of the radiologist role in healthcare system could create doubts on patients trust in their doctors' decisions, which represent the foundation of good patient-doctor relationship.

In this light we have conducted the study in order to assess how correctly patients identify the figure of the radiologist, differing him from the radiographer, and realize his role in interpreting imaging.

METHODS

We conducted a survey in outpatient clinic of Radiological Sciences department of the University Hospital "A. Gemelli" in Rome, in the period June – September 2013. Eligible for the inclusion were all patients subjected to chest X-ray, ultrasonography (US), mammography, computerized tomography (CT) or magnetic resonance (MR) who were willing to disclose their level of education.

Immediately after the examination patients were interviewed by a trained physician using structured questionnaire. The questionnaire comprised the questions on age, gender, level of education, accurate identification of role of radiologist and radiographer, level on satisfaction with services received and preferences concerning the scheduling the exam and receiving the results. However, for this analysis, except data on demographics and level of education we used only answers to questions concerning role of radiologist and radiographer, namely questions *"Who performed your examination?"* and *"Who is going to interpret your radiological examination?"*. The correct answer on the first question is considered to be *"radiologist"* for patients who underwent US and *"radiographer"* for all the other kind of exams. For the second question only the answer *"radiologist"* was always considered correct. The answer *"I don't know"* was considered wrong in relation to both questions. All the subjects who choose more than one answer to the same question we excluded from the analysis.

Statistical Analysis

Characteristics of the study population were summarized with descriptive statistics. Logistic regression models were performed to examine associations between demographic features and the likelihood of answering specific questions correctly. Adjusted odds ratios (OR) for age, gender and level of education were also calculated. All statistical analyses were performed using Stata software (StataCorp. 2013. Stata Statistical Software: Release 13. College Station, TX: StataCorp LP).

RESULTS

We included the number of 259 patients. Table 1 reports sociodemographic characteristics of the included as well as type of exams they were subjected to (Table 1). Majority were female 63.3%, most were 60-69 years old (24.3%) and have finished second grade secondary school (35.1%) (Table 1). The most of the included were subjected to magnetic resonance (28.6%) while the least were subjected to mammography (8.1%).

TABLE 1

SOCIODEMOGRAPHIC CHARACTERISTICS OF RESPONDING SUBJECTS AND EXAMS THEY WERE SUBJECTED TO (N=259)

	N	%
GENDER		
MEN	95	36.7%
WOMEN	164	63.3%
AGE		
‹40	54	20.8%
40-49	39	15.1%
50-59	41	15.8%
60-69	63	24.3%
70+	62	23.9%
EDUCATION LEVEL		
PRIMARY SCHOOL	37	14.3%
FIRST GRADE SECONDARY SCHOOL	62	23.9%
SECOND GRADE SECONDARY SCHOOL	91	35.1%
EDUCATION BEYOND SECONDARY SCHOOL	69	26.6%
EXAMINATION		
ULTRASONOGRAPHY	38	14.7%
MAMMOGRAPHY	21	8.1%
MAGNETIC RESONANCES	74	28.6%
CHEST X-RAY	63	24.3%
COMPUTERIZED TOMOGRAPHY	63	24.3%

Only 38.7% of patients in our study answered correctly to question No 1 "*Who performed your examination?*", and only 30.9% correctly identified the radiologist as a person interpreting the exam (question No 2 "*Who is going to interpret your radiological examination?*"). Overall, only 16.8% of the included responded correctly to the both questions.

Table 2 reports sociodemographic characteristics in relation to correct answers. We identified level of education to be significantly associated with correct recognition of the role of radiologist. Significantly less patients with primary school (OR: 0.18, CI 95% 0.06-0.49) and first grade secondary school (OR: 0.37, CI 95% 0.18-0.75) correctly addressed the question No 1 "*Who performed your examination?*" in compare to those with second grade secondary school (Table 2). The result were similar for question No 2 "*Who is going to interpret your radiological examination?*", as first grade secondary education (OR: 0.43, CI 95% 0.20-0.92) was inversely associated with correct answer in compare to second degree secondary education. Finally, when we addressed the impact of sociodemographic characteristics on answering well to the both questions, educational level appear again to be significant as those with primary education were significantly less prone to give both correct answers (OR: 0.12, CI 95% 0.02-0.60) while association for first grade secondary education was borderline significant (OR=0,40, CI 95% 0,16-1,01).

DISCUSSION

Our study reports insufficient level of knowledge among patients on the role of radiologist in healthcare system. We identified educational level to be associated with better understanding the radiologist role and his place in diagnostic algorithm.

Radiologists, despite overlaying an irreplaceable role in modern medicine continue engaging a marginal role for patients. Traditionally the radiologist deals

TABLE 2

SOCIODEMOGRAPHIC CHARACTERISTICS ASSOCIATED WITH KNOWLEDGE ABOUT RECOGNIZING THE FIGURE OF RADIOLOGIST AND HIS ROLE IN INTERPRETING IMAGING.

	QUESTION 1		QUESTION 2		BOTH	
	OR	CI 95%	OR	CI 95%	OR	CI 95%
GENDER						
MEN	Ref		Ref		Ref	
WOMEN	1.02	0.58-1.79	0.70	0.39-1.28	0.93	0.45-1.93
AGE						
<40	Ref		Ref		Ref	
40-49	1.75	0.74-4.16	0.91	0.38-2.15	1.47	0.49-4.39
50-59	1.18	0.49-2.81	0.71	0.28-1.79	1.56	0.50-4.87
60-69	1.53	0.67-3.46	0.69	0.30-1.61	1.44	0.49-4.20
70+	1.97	0.81-4.74	0.73	0.30-1.81	2.09	0.69-6.39
EDUCATION LEVEL						
PRIMARY SCHOOL	0.18	0.06-0.49	0.80	0.32-2.01	0.12	0.02-0.60
FIRST GRADE SECONDARY SCHOOL	0.37	0.18-0.75	0.43	0.20-0.92	0.40	0.16-1.01
SECOND GRADE SECONDARY SCHOOL	Ref		Ref		Ref	
EDUCATION BEYOND SECONDARY SCHOOL	0.62	0.33-1.19	0.69	0.34-1.37	0.58	0.26-1.33

Odds ratios adjusted for the characteristics listed in the table
Question 1: Who performed your examination?
Question 2: Who is going to interpret your radiological examination?

with the production of imaging and reporting. However, production is nowadays widely performed by radiographers. Furthermore, the relationship between radiologists and patients is very often mediated by radiographers and the radiology nurses or it is accomplished only through reporting. While for clinicians, even if temporally reduced compared to the past, doctor-patient relationship is safeguarded, during radiological examinations time for interviewing patients is drastically reduced up to zero, due to the exponential increase of the number of examination performed, forcing radiologists to use reporting as the only way to communicate, even with colleagues in ancillary disciplines [6]. A survey from 2008 performed in 66 radiological services reported that 80-90% of radiologists does not meet patients while the performance of cross-sectional examinations [4]. In this way radiologist is limited in his duties, waiving to be clinical-radiologist [7], loosing visibility, becoming no more than a supervisor for patient, who ascribe the role of interpreter of his performed radiological examination to the clinician who asked for the exam or to whom the patient is going to call on.

Therefore radiologists are in danger to be assimilated to an imaging implementer [8]. In a survey [9], performed in UK during 2008, around two-third of interviewed patients thought that radiologists had no role in choosing the most appropriate imaging test or in deciding the most appropriate treatment. Only 36% of respondents recognized the increasingly important role of radiologist in advising on the most appropriate investigations, and only 65% of patients thought that a radiologist reported their imaging tests. O'Mahony et al. reported that only 14% of patients included in their study knew that radiologists were medically qualified doctors [10].

Having all this in mind, it is no wonder that in eyes of the patient radiology occupies a medium-low grade between medical specialties in prestige and consideration. Furthermore this position has been always the same from the sixties [11], demonstrating an unchanged situation during decades [12], though radical changes in performing imaging from the point of technology and innovation. Our results are in the line with previously published, as we found the level of knowledge among Italian patients on role of radiologist to be highly insufficient.

We also find that it correlates with patient's level of education which is reasonable, as those with higher education are expected to better understand and precipitate the importance of radiologists in healthcare system functioning.

Our study has some limitations. Firstly, we do not have data on the number and sociodemographic characteristics of non-responders who decline to participate in the study. This could be important, as we found level of education to be significantly associated with the knowledge on radiologist role. Secondly, the similarity between terms radiologist and radiographer could make hard for some of the included patients to accurately address the questions. However this is the first study reporting the level of patients' recognition of radiologist role in Italian healthcare system and therefore important in planning its development and needed improvements.

In conclusion, we report insufficient knowledge among patients on radiologist's role in healthcare system. The level of knowledge is associated with level of education.

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