Original Article

Person-Centered Approach in Radiology Primary Health Care: A Cross-Sectional Study

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Abstract

Background: Person-centered approach is a model which healthcare providers work with patients and their families to identify and meet patients' needs and preferences.

Objective: This study was to evaluate the experience of the person-centered care in the outpatient radiology department in two Health Care Centers in Attica region

Methodology: The present study is a cross-sectional study with an anonymous questionnaire conducted in two Health Centers of Attica in September 2018 for four weeks. In total, the participants answered 38 questions divided into seven dimensions of the patient-centered approach in the radiology department: effective communication, patient education, physical comfort, emotional support and relief from fear and anxiety, care coordination, bad news, and patient satisfaction.

Results: Of the 181 people participated in the survey 55.2% were women, 44.8% were men, with mean age of 44.6 years. Of them, 82.2% knew that the radiologist is a doctor specially trained in the interpretation of radiological images and 71.7% also knew correctly that the technologist is a specially trained person who performs imaging tests; 91.7% said that the service at the reception desk of the radiology department was polite and only 19.9% said they engaged in a discussion with them to understand their emotional state (any concerns / fears) before the test. 84% of participants want to discuss the abnormal results with the radiologist face to face. Only 33% said they had been informed of any delay in their examination and only 22.1% said the staff had apologized for their waiting longer in the waiting room.

Conclusions: Improving communication skills is expected to optimize the ability of radiologists and technologists to identify individuals' needs and preferences and provide high-level person-centered care.

Key-words: Person-centered care, radiology, effective communication, services satisfaction, care coordination.

Introduction

Person-centered approach means that the needs of individuals across health care trajectory, with emphasis on physical and emotional support, are placed in the center of health care system (Green, 2006). Under the same conceptual framework, patient-centered care is a model in which health care providers work with patients and their families to identify and meet patients' needs and preferences (Itri, 2015; Kemp et al., 2017).

However, in order for a system to be truly patient-centered, care must be integrated into the whole spectrum of the system (Aura, 2010).

Patient-centered care is associated with a high rate of patient satisfaction, adherence to recommended lifestyle changes and prescription treatment, better outcomes, and more cost-effective health care (Reynolds, 2009). According to Itri (2015), the dimensions of patient-centered care are:

- Effective communication.

- Patient education.

- Physical comfort.

- Emotional support and relief from fear and anxiety.

- Respect for the values of patients, their preferences and needs.

- Complete, ongoing & coordinated care.

- Family / friend participation.

Patients' experience in a radiology department is largely shaped by multidisciplinary interactions such as technologists, nurses, reception staff, and rarely by radiologists (Brook et al., 2017). Radiologists have traditionally been described as medical counselors who are away from patients and work in an environment that does not value the patient-centered approach (Itri, 2015). Unlike their clinical colleagues, they have little or no relationship with the patients to whom they provide services. Therefore, they miss the opportunity to promote a long-term and cooperative relationship. In addition, the limited time available to radiologists significantly reduces their ability to be engaged in an interpersonal dialogue with their patients, and instead electronic tools have replaced and interactive communication (Reiner, 2013). A great number of patients do not understand the role of radiologists, but even a larger number of patients recognize this deficit and would like to learn more about the role they play in their care (Miller et al., 2013). Despite the importance and challenges inherent in radiologist-patient communication, radiologists reported more than other specialists (80% vs. 47%) that they felt inadequately trained in their communication skills (Lown, Sasson, Hinrichs, 2008). The doctor-patient relationship requires bidirectional interactions (Weldon et al., 2016). When the healthcare providers start focusing and fully examining their patient's experience, from planning the imaging test up to the medical opinion, official information, and communication in the future, this means that an effort has been made to improve care and experience of patients' as a whole, and it is not carried just for the delivery of results (Kemp et al., 2017).

Moreover, efforts to develop a patient-centered culture in radiology department and optimize the relationship between the patient and the radiologist do not have the desired results (Manqano et al., 2014). In Greece, there is a lack of evidence about person-centered approach in radiology. Thus, the purpose of this study was to evaluate the experience of the participants on the person-centered care in the outpatient radiology departments of Primary Health Care.

Methodology

The present cross-sectional study was conducted in two Health Care Centers in Attica region (i.e. Markopoulo and Rafina-Pikermi) during September 2018. The participants were randomly selected from the outpatient's department who were forwarded for an X-ray or an ultrasound to the radiology department. An anonymous questionnaire was completed, before the imaging examination, regarding the evaluation of their previous experience in the radiology department.

The questionnaire was developed based on Itri (2015). It consisted of 38 questions that were divided into the following sections: a) "Effective Communication" which included 14 questions. The score AIDET was used (Acknowledge, Introduce, Duration, Explanation, Thank you) which refers to a set of skills that can be used to improve communication between patients and health care providers in a radiology department. e.g. Did the radiologist or technologist who performed the test welcome you? b) "Patient Education" included 3 questions regarding information on the procedures of imaging exams, e.g. Did the staff of the radiology department help you, according to your referral, to understand the type of examination (x-ray or ultrasound) that you will undergo? c) **"Physical Comfort"** included 4 questions about the significant impact of physical environment on individual's experience, e.g. Do you think that the cleaning in the areas of the radiology department (waiting room and examination room) was sufficient? d) "Emotional Support and Alleviation of Fear and Anxiety" included 4 questions about patient's experience of illness,

e.g. Were the radiologist or technologist interested in your emotional state (fear, anxiety, shame) during the test? e) "Care Coordination" included 3 questions about the loss or the overlook of important information. e.g. Do you think that the radiology department staff had the necessary communication skills to give you the help you needed? f) "Delivering Bad News" included 3 questions about the fundamental principles of announcing bad news. e.g. Do you want to discuss the test results with the radiologist? g) "Patient Satisfaction" included 7 questions about participants' satisfaction during exams procedure, e.g. Are you overall satisfied with the care provision at the radiology department?

Ethical considerations

The study was approved by the 1st Health District of Attica Region. The participation was voluntary and anonymous. Participants were informed about the aim and the procedure of the study and the completed questionnaire was regarded as their consent.

Data analysis

The SPSS 22.0 statistical program was used for the analysis. Mean values, standard deviations (SD), median and interquartile range were used to describe quantitative variables. The absolute (N) and relative (%) frequencies were used to describe the qualitative variables. The non-parametric Mann-Whitney criterion was used to compare quantitative variables between two groups. The nonparametric Kruskal-Wallis criterion was used to compare quantitative variables between more than two groups. For the control of type I error, due to multiple comparisons, the Bonferroni correction was used according to which the significance level is $0.05 / \kappa$ (κ = the number of comparisons). The Wilcoxon signed test was used to compare the scores of the sectors. The Spearman correlation coefficient (r) was used to control the relationship between two quantitative variables. Linear regression analysis was performed using logarithmic transformations. The internal reliability of the questionnaire was checked using the Cronbach's-a factor. The significance levels are bilateral and the statistical significance was set at 0.05.

Results

The study participants were 181 (55.2% were women and 44.8% were men) with an average age of 44.6 (±13) years, and 96.6% of the participants had insurance coverage (*Table 1*). Out of the total, 92.2% had visited a radiology department at least once in the past; 82.2% knew that radiologist is a doctor specially trained in the interpretation of radiology images and 71.7% knew that technologist is a specially trained person who performs imaging tests. 25.4% didn't know what an X-ray or an ultrasound (U/S) is (*Table 2*). Of the participants, 91.7% and answered that the staff was polite and 93.9% reported that they were well informed about the examination process. However, only 12.2% stated that the radiologist who examined them had introduced himself/herself and only 38.1% were thanked for their cooperation at the end of the examination. About half (46.4%) reported that they were given time to ask questions or express any concerns but only 19.9% mentioned that radiologists discussed with them in order to understand their emotional state (any concerns/fears) before the test. Concerning the consistency in the scheduled appointment, only 33% said they had been informed about any delay in their examination and only 22.1% said they had been asked for an apology in case they had to wait longer in the waiting room. The majority of the participants positively assessed the environment of the outpatient department in terms of cleanliness (79%) and sense of privacy during the examination (90.1%) but only 33.7% of participants stated that the interior design (e.g. furniture, decoration, noise levels) helped them eliminate tension and anxiety. About one in two participants (48%) said they received some kind of support due to fear/anxiety, shame and pain throughout the test. However, only 30.4% said that the radiologist or the technologist, on their own initiative, asked about their patient's emotional state during the examination (e.g. if they feel fear, anxiety, shame, pain). Overall, most of the participants (79%) were satisfied with the level of care and attention with which they were treated at the radiology outpatient department and the reliability of the services they received (92.3%). To further examine the relationship between the participants' characteristics, their knowledge on diagnostic imaging tools and the dimensions of the patient-centered approach, multifactor linear regression analysis was applied.

Table 1. Socio-demographic characteristics of the participants (n=181)

		N	%
Gender	Men	81	44.8
	Women	100	55,2
Age (±SD)		44.6 (13.0)	
Educational status	Elementary school	12	6.6
	Junior High school	11	6.1
	Senior High school	60	33.1
	University education	98	54.1
Insurance coverage	No	6	3.4
	Yes	173	96.6

Table 2. Knowledge on the imaging tests

		N	%
The radiology is	Nurse specially trained in imaging tests	16	8.9
	Radiology technician performing the imaging tests	16	8.9
	Physician specially trained in interpreting in imaging tests	148	82.2
The radiology technician is	Nurse specially trained in imaging tests	43	23.9
	Someone specially trained to perform imaging tests	129	71.7
	Someone specially trained to perform ultrasound examinations	8	4.4
Are you aware of what an X-ray or an ultrasound is? (e.g. why is this test performed for, what are the benefits and the potential risks?)	No	46	25.4
	Yes	134	74.0
	I cannot remember	1	0.6
Other information sources on x-ray and an ultrasound?	Media (TV, magazines, internet)	27	14.9
	Medical websites	31	17.1
	Health professionals	124	68.5
	Personal experience	1	0.6
	My children	1	0.6
	Doctor	1	0.6
	Friends	2	1.1
	No source	9	5.0
Was this your first visit at a radiology department?	No	165	92.2
	Yes	14	7.8
Where did you perform your last imaging test?	Public hospital	100	55.6
	Private hospital	80	44.4

Table 3. The results of the multifactor linear regression, with a dependent variable in the grading of effective communication and the independent variables of the demographic data of the participants and their knowledge on X-rays and ultrasound

		β[+]	SE[++]	P
Gender	Men (ref)			
	Women	-0.01	0.04	0.777
Age		-0.004	0.002	**0.028**
Educational status	Elementary / High school/ Senior High school (ref)			
	University education	0.04	0.04	0.392
Insurance coverage	No (ref)			
	Yes	0.04	0.11	0.693
The radiologist is	Physician specially trained in interpreting in imaging tests (ref)			
	Nurse specially trained in imaging tests	0.00	0.07	0.980
	technologist performing the imaging tests	0.05	0.07	0.477
The technologist is	Someone specially trained to perform ultrasound examinations (ref)			
	Nurse specially trained in imaging tests	-0.10	0.10	0.307
	A person specially trained to perform imaging tests	-0.16	0.09	0.086
Are you aware of what an X-ray or an ultrasound is? (e.g. why is this test performed for, what are the benefits and the potential risks?)	No (ref)			
	Yes	0.09	0.04	**0.039**
Where are you informed from on what an x-ray and an ultrasound is?				
Media (TV, magazines, internet)	No (ref)			
	Yes	0.09	0.06	0.175
Medical websites	No (ref)			
	Yes	0.00	0.06	0.961
Health care providers	No (ref)			
	Yes	-0.03	0.05	0.595
No one	No (ref)			
	Yes	-0.04	0.10	0.652
Was this your first visit at a radiology department?	No (ref)			
	Yes	0.00	0.08	0.973
Where did you perform your last imaging test?	Public hospital (ref)			
	Private hospital	0.01	0.04	0.715

[+] dependence factor [++]typical coefficient error

Table 4. The results of the multifactor linear regression, with a dependent variable of Grading of patient education and independent variables being their demographic data and their knowledge on X-rays and ultrasounds

		β[+]	SE[++]	P
Gender	Men (ref)			
	Women	0.00	0.06	0.993
Age		0.00	0.00	0.102
Educational status	Elementary / High school/ Senior High school (ref)			
	University education	-0.04	0.07	0.559
Insurance coverage	No (ref)			
	Yes	-0.12	0.18	0.509
The radiologist is	Physician specially trained in interpreting in imaging tests (ref)			
	Nurse specially trained in imaging tests	0.09	0.12	0.427
	technologist performing the imaging tests	0.02	0.11	0.851
The technologist is	Someone specially trained to perform ultrasound examinations (ref)			
	Nurse specially trained in imaging tests	-0.37	0.16	0.065
	A person specially trained to perform imaging tests	-0.29	0.15	0.060
Are you aware of what an X-ray or an ultrasound is? (e.g. why is this test performed for. what are the benefits and the potential risks?)	No (ref)			
	Yes	-0.15	0.07	**0.036**
Where are you informed from on what an x-ray and an ultrasound is?				
Media (TV, magazines, internet)	No (ref)			
	Yes	-0.09	0.11	0.379
Medical website	No (ref)			
	Yes	-0.33	0.10	0.061
Health care providers	No (ref)			
	Yes	-0.21	0.09	0.072
No one	No (ref)			
	Yes	-0.28	0.17	0.115
Was this your first visit at a radiology department?	No (ref)			
	Yes	-0.20	0.12	0.105
Where did you do your last imaging test?	Public hospital (ref)			
	Private hospital	-0.04	0.06	0.542

[+] dependence factor [++]typical coefficient error

Table 5. The results of the multifactor linear regression, with a dependent variable the grading of the environment and independent the demographic data and their knowledge on X-rays and ultrasounds

		β[+]	SE[++]	P
Gender	Men (ref)			
	Women	-0.10	0.06	0.086
Age		0.00	0.00	0.269
Educational status	Elementary / High school/ Senior High school (ref)			
	University education	-0.09	0.07	0.202
Insurance coverage	No (ref)			
	Yes	-0.19	0.17	0.270
The radiologist is	Physician specially trained in interpreting in imaging tests (ref)			
	Nurse specially trained in imaging tests	0.16	0.11	0.142
	technologist performing the imaging tests	0.20	0.11	0.068
The technologist is	Someone specially trained to perform ultrasound examinations (ref)			
	Nurse specially trained in imaging tests	0.03	0.16	0.848
	A person specially trained to perform imaging tests	-0.15	0.15	0.308
Are you aware of what an X-ray or an ultrasound is? (e.g. why is this test performed for, what are the benefits and the potential risks?)	No (ref)			
	Yes	0.10	0.07	0.172
Where are you informed from on what an x-ray and an ultrasound is?				
Media (TV, magazines, internet)	No (ref)			
	Yes	-0.16	0.10	0.116
Medical website	No (ref)			
	Yes	0.19	0.10	**0.049**
Health care providers	No (ref)			
	Yes	0.13	0.09	0.079
No one	No (ref)			
	Yes	0.07	0.15	0.637
Was this your first visit at a radiology department?	No (ref)			
	Yes	-0.14	0.12	0.256
Where did you do your last imaging test?	Public hospital (ref)			
	Private hospital	0.23	0.06	**<0.001**

[+] dependence factor [++] typical coefficient error

Regarding the effective communication, older participants graded effective communication lower, signifying a lower assessment of the services offered in the department (*p*=0.028). However, those who were well aware of what X-rays and ultrasounds were, assessed the services more positively compared to the participants who were not knowledgeable (*p*=0.039) (*Table 3*). As regards patient education those who were well aware about X-rays and ultrasounds they assessed the services significantly worse compared to the participants who were not knowledgeable (*p*=0.036) (*Table 4*).

Participants who were informed from the website about the examinations evaluated the environment significantly better compared to the participants who were not informed from there (p=0,049). Furthermore, the participants who had conducted their latest tests in the private sector assessed the environment significantly better compared to the participants who were tested in the public sector ($p<0.001$) (*Table 5*).

About the other three dimensions, i.e. "emotional support and relief from fear and anxiety", "delivering bad news" and "patient's satisfaction" no significant associations with participants' characteristics and their knowledge on imaging tests were observed.

Discussion

Person-centered care is a collective effort that leads to improve quality of services. In Greece, there is a lack of evidence about person-centered care in radiology. The present study is the first to evaluate participant's experiences regarding the person-centered approach in the radiology outpatient department, in Primary Healthcare settings.

In the present study it was observed that 7 out of 10 participants were well aware of what X-rays and ultrasounds were and their main source of information (68.5%) was the healthcare providers. A similar study, showed that 82% of participants were informed from their doctor for the importance of the tests and 72% had as their main source their family and friends (Chesson et al, 2002). Bussey et al. (2013) who investigated patients' knowledge of ionizing radiation, found that most patients (69%) reported their health care provider as their main source of health information.

With regard to the announcement of the test results, 2.6% of the participants wished to receive the tests results from the radiologist face to face if they were normal and 8.3% if they were not normal (Mangano et al., 2014). In the present study, 87% of the participants preferred to discuss the results with the radiologist face to face, while in case of not normal test results the percentage decreased to 84%. Moreover, in the present study, the findings showed that the percentage of the participants who were aware of the role of the radiologist and of the technologist was quite high. Specifically, 8 out of 10 participants were aware that the radiologist is a doctor specifically trained in the interpretation of the imaging tests and 7 out of 10 were aware that the technologist is a person specifically trained to perform imaging tests. Similarly, among the respondents, 56% recognized the radiologist as a doctor who interprets imaging tests while 38% confused him with the technologist (Pahade et al., 2012). Accordingly, only 60% of the study sample knew about the role of radiologist (Kuhlman et. al., 2012).

A possible limitation is the small study sample and the number of health centers that do not allow us to generalize the results to all outpatients' radiology departments in Attica region. However, since they constitute the first data from the Greek region, the present study forms a reference study for future research about the person-centered approach in primary healthcare radiology. In an era where the role of the radiologist is extremely important and demanding, technological evolution in combination with a constantly increasing work load, the lack of staff and the necessity of incessant and focused labour have led to the complete separation of the radiologists from their patients (Nairz et al., 2018). All radiologists do not have the same desire or ability to talk to their patient (Funaki, 2015). The findings of this study emphasize the need for participants to communicate with the radiology department staff. To conclude, continuous education of radiologists and technologists is needed in order to develop communication skills and increase their ability to identify individuals' needs and preferences and therefore, to provide high quality person-centered care.

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