



APPROACHES OF DENTOMAXILLOFACIAL AND MEDICAL RADIOLOGISTS ABOUT REPORTING

Dentomaksillofasiyal ve Medikal Radyologların Raporlamayla İlgili Uygulamaları

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ABSTRACT

Objectives: Radiological reporting is a relatively new and challenging issue in dentomaxillofacial radiology, whereas it has been performed so many years in medical radiology. The purpose of this study is to compare approaches of dentomaxillofacial and medical radiologists regarding radiology reporting.

Materials and Methods: Dentomaxillofacial and medical radiologists were invited by e-mail. The participants filled a survey regarding the features of their own radiology reports. The study was based on two independent groups (dentomaxillofacial and medical radiologists). Mann-Whitney U test was used for two independent groups.

Results: 285 radiologists in total (115 dentomaxillofacial and 170 medical radiologists) participated in this survey. Structured radiologic reports were mostly preferred by both dentomaxillofacial (53.9%) and medical radiologists (77%), but statistically significant difference was found between two groups ($p<0.05$). Although dentomaxillofacial (79.1%) and medical (81.2%) radiologists mostly reported that their own reports consisted of separate headings as clinical information, findings and conclusion, there was a statistically significant difference between two groups ($p<0.05$). The majority of dentomaxillofacial (99.1%) and medical (99.4%) radiologists agreed regarding radiology training programs should include radiology report construction.

Conclusion: This is the first study pointing out the approaches of dentomaxillofacial radiologists about reporting. Good radiological reporting is a relatively new task for dentomaxillofacial radiologists compared to medical radiologists. This study showed that the approaches of dentomaxillofacial and medical radiologists were similar regarding radiological reports.

Key words: Medical Education, Radiology, Dentistry, Medicine, Survey

ÖZ

Amaç: Radyolojik raporlama dentomaksillofasiyal radyoloji için görece yeni ve ilgi çekici bir konudur, oysa medikal radyolojide uzun yıllardan beri yapılmaktadır. Bu çalışmanın amacı, dentomaksillofasiyal ve medikal radyologların radyolojik raporlama ile ilgili uygulamalarını karşılaştırmaktır.

Materyal ve Metot: Dentomaksillofasiyal ve medikal radyologlar çalışmaya e-posta ile davet edildi. Katılımcılar kendi radyoloji raporlarının özellikleriyle ilgili sorulardan oluşan bir anketi doldurdular. Çalışma, dentomaksillofasiyal ve medikal radyologlar olmak üzere iki bağımsız gruptan oluşmaktaydı. Bu iki bağımsız grup için Mann-Whitney U testi yapıldı.

Bulgular: Toplam 285 radyolog (115 dentomaksillofasiyal ve 170 medikal radyolog) çalışmaya katıldı. Hem dentomaksillofasiyal (%53.9) hem de medikal radyologlar (%77) tarafından çoğunlukla yapılandırılmış radyolojik raporlar tercih edilmekteydi, fakat iki grup arasında istatistiksel olarak anlamlı fark bulunamadı ($p<0.05$). Dentomaksillofasiyal (%79.1) ve medikal radyologlar (%81.2) çoğunlukla kendi raporlarının klinik bilgi, bulgular ve sonuç olmak üzere ayrı başlıklardan oluştuğunu belirtmekle birlikte, iki grup arasında istatistiksel olarak anlamlı fark vardı ($p<0.05$). Dentomaksillofasiyal (%99.1) ve medikal radyologların (%99.4) büyük çoğunluğu radyoloji eğitim programlarının radyoloji raporu yorumlamasını da kapsamayı gerektiği konusunda hemfikir idi.

Sonuç: Bu çalışma dentomaksillofasiyal radyologların raporlama uygulamalarıyla ilgili ilk çalışmadır. İyi radyolojik raporlama yapmak dentomaksillofasiyal radyologlar için görece olarak yeni bir görevdir. Bu çalışma dentomaksillofasiyal ve medikal radyologların radyolojik raporlama ile ilgili uygulamalarının benzer olduğunu gösterdi.

Anahtar kelimeler: Tıp Eğitimi, Radyoloji, Diş Hekimliği, Tıp, Anket

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INTRODUCTION

A radiological report summarizing the radiologic examination is a patient's permanent medical record and it is the most important communication.¹ The appropriate construction and clarity of the radiological report are essential for high quality patient care as well as the requirement of clinical focus.² Additionally, the radiological report contains prediagnosis and/or diagnosis, a suitably ordered differential diagnosis and, sometimes suggestions for further evaluation. The radiological report also reflects the radiologist's knowledge, skill and training levels.³ It can provide multifaceted information about the patient's experience in the radiology department and finalizes with the imaging observations, conclusions, and recommendations.² Communicating the results of imaging procedure to the referring physician and the patient is the primary goal of the radiology report.⁴

The ideal format for the radiology report has not been found and there is no generally accepted format. The presence of wide variety style in reporting may explain this situation.⁵ The radiologists have used two basic forms as traditional free-text and structured reports. Traditional free-text radiology report is dictated in narrative style, any order and format chosen by radiologist. This type of radiology report is mostly non-standardized, deficient, uncertain and error prone.⁶ In recent years, structured reports have replaced traditional free-text radiology reports.⁷ Structured reporting means the use of predefined formats and terms to create reports; in this sense, structured reports are based on templates or checklists.⁴ Radiology report is not only an important communication tool among radiologist and referring clinician, but also a legally binding document.^{1,7} Structured radiology reports include several advantages such as clarity, time-efficiency, automated billing and order entry, presence of technical

parameters, measurements, annotations, reduction of ambiguity.^{4,8,9} Hence, recently, structured radiology reports are preferred by many radiologists and clinicians. Various authors agree regarding many benefits of structured reporting.¹⁰⁻¹³

Recently, the radiological reports are prepared by both medical and dentomaxillofacial radiologists. In dentomaxillofacial radiology, extraoral and intraoral radiographic examinations and especially cone-beam computed tomography (CBCT) images are reported in routine clinical dental practice. Radiology reporting is a relatively new and challenging issue in dentomaxillofacial radiology, whereas radiology reporting has been performed so many years in medical radiology. With the increasing use of CBCT, various necessities have emerged about radiology reporting in dentomaxillofacial radiology.¹⁴ The approaches of medical radiologists about the reporting are generally well-known. According to best of our knowledge, there is no study about approaches of dentomaxillofacial radiologists.

The purpose of this study was to compare approaches of dentomaxillofacial radiologists and medical radiologists regarding radiology reporting.

MATERIALS AND METHODS

The study was approved by Gazi University Institutional Review Board (decision number, 77082166/604, 01/02).

The radiologists were invited by e-mail in two separate links via surveey.com, a web-based survey tool for dentomaxillofacial radiologists and medical radiologists to participate the study. Before invitation of the individuals, The Boards of National Oral Diagnosis and Maxillofacial Radiology and Turkish Radiology Society were asked for permissions and their approvals were obtained. The survey contained 15 questions (Appendix).

All participants both radiologists and residents were considered as radiologists in this study. Responders were asked to enter demographic data and the questions about their radiology reports now.

Statistical analysis was performed by using SPSS software, 23.0 version (SPSS Inc., Chicago, USA). Frequency tables were prepared for all questions and answers. The study was based on basically two independent groups as dentomaxillofacial radiologists and medical radiologists. Mann-Whitney U test was used for two independent groups. P values of 0.05 were considered to indicate a statistically significant difference.

RESULTS

In total 285 radiologists (115 dentomaxillofacial and 170 medical radiologists) participated in this survey. The features of the participants including age, gender, academic degrees, relevant institution and examination methods are shown in Table 1. The majority of dentomaxillofacial radiologists was female (64.3%) and most medical radiologists was male (62.9%).

Table 1. Distribution of demographic information, academic degrees, relevant institution and examination methods of the participants

The features of the participants		Dentomaxillofacial Radiologists (%; n)	Medical Radiologists (%; n)
Demographic information	Female	64.3%; 74	37.1%; 63
	Male	35.7%; 41	62.9%; 107
	Mean age and age range	35.9(24-72)	34.4(24-67)
Academic degrees	Resident	39.1%; 45	38.8%; 66
	Lecturer	3.4%; 4	1.2%; 2
	Assistant professor	20.9%; 24	4.7%; 8
	Associate professor	11.3%; 13	8.2%; 14
	Professor	11.3%; 13	7.6%; 13
	Specialist	13%; 15	39.4%; 67
Relevant institution	Oral and Dental Health Center	6.1%; 7	-
	Community hospital	0.9%; 1	38.2%; 65
	Private sector	1.7%; 2	11.8%; 20
	University	91.3%; 105	50%; 85
Methods of examinations	Periapical radiograph	38	-
	Panoramic radiograph	60	-
	Cone-beam computed tomography	96	-
	Ultrasound	2	152
	Others	24	-
	Magnetic resonance imaging	-	119
	Computed tomography	-	156
	Conventional methods	-	128

The participation of residents (39.1%) was more common in dentomaxillofacial radiologists and specialists (39.4%) were higher than the others for medical radiologists. The participants for both dentomaxillofacial (91.3%) and medical radiologists (50%) mostly worked in universities. The most common

examination methods were CBCT and computed tomography for dentomaxillofacial and medical radiologists, respectively (Table 1). Regarding working time in radiology department and reporting time, the majority of both dentomaxillofacial (42.6%) and medical radiologists (31.8%) were 1-5 years (Table 2).

Table 2. The distribution of participants for working time in radiology department and their reporting time

Items	Working time in radiology department		Reporting time	
	Dentomaxillofacial Radiologists (%; n)	Medical Radiologists (%; n)	Dentomaxillofacial Radiologists (%; n)	Medical Radiologists (%; n)
I have not written report	-	-	17.4%; 20	1.2%; 2
0-6 months (including 6 months)	-	5.3%; 9	7%; 8	5.9%; 10
6 month- 1 year (including 1 year)	6.1%; 7	9.4%; 16	13%; 15	9.4%; 16
1-5 years (including 5 years)	42.6%; 49	29.4%; 50	42.6%; 49	31.8%; 54
5-10 year (including 10 years)	13%; 15	28.2%; 48	12.2%; 14	24.7%; 42
More than 10 years	38.3%; 44	27.6%; 47	7.8%; 9	26.5%; 45

Regarding the sources for writing a good radiology report of the participants during their training (question 6), the majority of dentomaxillofacial radiologists (43.5%) reported as teaching staff and medical radiologists reported as more senior trainees (77.6%). There was a statistically significant difference between two groups ($p < 0.05$; Table 3). Regarding the format of radiology report construction, the majority of dentomaxillofacial radiologists and medical radiologists stated that they used the structured report, 53.9% and 77%, respectively (question 7). A statistically significant difference was found between two groups ($p < 0.05$; Table 3). Regarding the use of language in radiology report, the majority of dentomaxillofacial radiologists (60.9%) and medical radiologists (84.1%) noticed using common words with clinicians (question 15). There was a statistically significant difference between two groups ($p < 0.05$; Table 3).

The majority of dentomaxillofacial and medical radiologists reported that patients mostly wanted verbal information about their own findings after examination (question 8). Statistically significant difference was found between two groups ($p < 0.05$; Table 3).

Table 3. The comparison between dentomaxillofacial and medical radiologists for sources during radiology training in radiology report construction, report format and language of the report

Questions	Items	Dentomaxillofacial Radiologists (%; n)		Medical Radiologists (%; n)		P value
6. Which sources did you use during your training as radiologist how to make a good report?	Teaching staff	43.5%; 50		58.2%; 99		0.004*
	More senior trainees	21.7%; 25		77.6%; 132		
	Article	30.4%; 35		36.5%; 62		
	Courses	10.4%; 12		34.7%; 59		
	No education	33%; 38		4.1%; 7		
7. Which format have you used in radiology report construction?	Free text format	39.1%; 45		21.7%; 37		0.008*
	Structured report	53.9%; 62		77%; 131		
	Blank	7%; 8		1.1%; 2		
8. Do the patients want verbal information about findings after examination?	Often	25.2%; 29		24.7%; 42		0.02*
	Sometimes	43.5%; 50		66.5%; 113		
	Never	23.5%; 27		8.8%; 15		
13. How a language have you use when you write report?	I use medical language including radiologic terminology	38.3%; 44		15.9%; 27		0.001*
	I use common words with clinicians to read the radiology report more easily.	60.9%; 70		84.1%; 143		
	I use simple, basic language which community understand	0.9%; 1		-		

*Difference is statistically significant

Regarding clinical information, findings and the conclusion of the report put into separate paragraphs, most of all participants agreed (question 9). No statistically significant difference was found between two groups ($p > 0.05$; Table 4). The participants mostly reported that their radiology reports ended with a conclusion, included technical details and radiology training programs should include radiology report construction (question 12, 13 and 14). No statistically significant difference was found between two groups ($p > 0.05$; Table 4).

Table 4. The comparison between preferences of dentomaxillofacial and medical radiologists about reporting

Variables	Dentomaxillofacial Radiologists (%; n)		Medical Radiologists (%; n)		P value
	Yes	No	Yes	No	
9. Do your radiology reports consist of separate paragraphs such as clinical information, findings and the conclusion?	79.1%; 91	20.9%; 24	81.2%; 138	18.8%; 32	0.67
10. Do your radiology reports end with a conclusion?	79.1%; 91	20.9%; 24	83.5%; 142	16.5%; 28	0.5
11. Do your radiology reports include technical details?	99.1%; 114	0.9%; 1	75.9%; 129	24.1%; 41	0.9
12. Should radiology training programs include radiology report construction?	99.1%; 114	0.9%; 1	99.4%; 169	0.6%; 1	0.7

DISCUSSION

Radiology provides two essential services consisting of imaging procedures and radiologic reports. The centerpiece of a radiologist's communication is based on radiology report.^{2,15} The radiology report is a multifunctional document and invaluable reference for the billing process as well as providing service.¹⁵ Recently, due to the increasing complexity of medical and dentomaxillofacial radiology practices have resulted in new medicolegal pitfalls.¹⁶ Therefore, this topic has become more popular among researchers and various studies regarding the satisfactions and reporting practices of radiologists have been performed.

However, these studies have focused on the states and practices of medical radiologists.^{12,17} According to best of our knowledge, this is the first investigation about approaches of dentomaxillofacial radiologists and comparison with medical radiologists.

The radiology residents must learn multiple facets of radiology practice, especially the construction of radiology reports during their training.¹² However, most of the time there is no specific lecture related with radiology report in the training period. Siström *et al.*¹⁸ stated that radiology residents received no more than one hour of didactic instruction for radiology reporting per year. Instructions for radiology reporting mostly are based on apprenticeship model. Trainees learn primarily from one-on-one interaction with attending radiologists and more senior trainees in this model.¹⁹ It has been reported that 98% of medical radiology residents did not receive any education about reporting, and 78% of the residents prepared the reports under supervision and guidance of a senior resident.²⁰ In this study, 4.1% of medical radiologists and 33% of dentomaxillofacial radiologists reported that no education was received related with reporting during their training period. Additionally, 77.6% of medical radiologists and 21.7% of dentomaxillofacial radiologists noticed that they prepared the reports in guidance of more senior trainees. The results of this study for medical radiologists about absence of education regarding reporting were different, but about preparation of reports under supervision of a senior resident were very similar to the results of previous studies.

Bosmans *et al.*¹² stated that 56.7% of the radiologists had learned the reporting during their training and Lam *et al.*²¹, reported that 83.7% of the residents said learning is better when teaching others and 86.4% of them thought teaching opportunities improved their educational experience. All previous studies have been analyzed by medical radiologists

and/or residents. No study has focused on approaches of dentomaxillofacial radiologists. In this study, approaches of medical and dentomaxillofacial radiologists were compared about reporting. The majority of dentomaxillofacial radiologists remarked that they learned the reporting from teaching staff, whereas most medical radiologists remarked that they learned from more senior trainees. Almost all participants (99%) agreed about the education of radiology report should be a mandatory part of radiology residency training.

The radiology report is divided into six sections: examination, history/indication, technique, comparison, findings and impressions. This type of report is considered as structured report including paragraphs and headings that distinguish the basic elements of the reports.²² Bosmans *et al.*¹² reported that most of the radiologists mentioned the use of separate headings for each organ system when reporting complex examinations. Powell *et al.*¹⁷ stated that 59.5% of radiologists were satisfied with their structured report. In another study, most radiologists represented that the reports should occur in separate paragraphs such as clinical information, radiologic findings, conclusion and impressions.¹² Also, 91% of medical radiologists stated that a conclusion should be taken at the end of report if it is longer than a few lines.¹² In the present study, 79.1% of dentomaxillofacial radiologists and 81.2% of medical radiologists reported that their own radiology reports consisted of separate paragraphs as clinical information, radiologic findings and conclusion. The results of this study were in accordance with previous studies.^{12,17,22}

A radiology report must be dictated in a plain language. Some authors have suggested that it could be understood by the average high school graduate.¹⁶ However, this condition may be disliked by more experienced and specialized practitioners.¹⁶ Knowledge and expertise level of the referrer should be

considered by the radiologist when the report is constructed. Medical radiologists mostly thought that a radiology report should be easily intelligible, and radiologists should use common words with referrer clinicians.¹² In the present study, 60.9% of dentomaxillofacial radiologists and 84.1% of medical radiologists stated that common words with clinicians were used to read the radiology report more easily. The results of this study were in accordance with previous studies.^{12,16}

Alan *et al.*²³ emphasized that, most radiologists experienced their patients' request of verbal information after examination. In the same study, 36% of radiologists thought that verbal information should be given when the patient wants.²³ In this study, most of all participants reported that patients mostly want verbal information about imaging results. This result was in accordance with previous study.²³

There were some limitations in the study. Firstly, this study was performed in Turkey and results may vary in different societies. Secondly, the number of medical radiologists was higher than the others, due to the limited number of dentomaxillofacial radiologists.

In conclusion, this is the first study pointing out the approaches of dentomaxillofacial radiologists about reporting. Good radiological report is a relatively new task for dentomaxillofacial radiologists in comparison with medical radiologists. All the radiologists have become more liable to the patients due to increasing malpractice lawsuits in recent years. The results of this study showed that both dentomaxillofacial and medical radiologists were mostly in agreement and their approaches were similar regarding the radiological reports.

All the radiologists concurred for the main topics as listed below:

1. Specific lectures regarding the preparation of good radiologic report should be added to

the curriculum during training of both medical and dentomaxillofacial radiology expertise.

2. Structured radiologic reports including separate paragraphs such as clinical information, radiologic findings, conclusion and impressions are useful in clinical practice. This type of reports was preferred by both medical and dentomaxillofacial radiologists.

3. The radiologists generally use common words with the clinicians in the reports.

REFERENCES

1. Turkish Society of Radiology Qualification Board, Standards and Guide Committee, Traditional Radiology Report Written Guideline Document No. 001; 2008.
2. Kahn CE Jr, Langlotz CP, Burnside ES, Carrino JA, Channin DS, et al. Toward best practices in radiology reporting. *Radiology* 2009; 252: 852–856.
3. Summers JB, Kaminski J. Reporting instruction for radiology residents. *Acad Radiol* 2004; 11: 1197.
4. Reiner BI, Knight N, Siegel EL. Radiology reporting, past, present, and future: the radiologist's perspective. *J Am Coll Radiol* 2007; 4: 313–319.
5. Bosmans JM, Weyler JJ, Parizel PM. Structure and content of radiology reports, a quantitative and qualitative study in eight medical centers. *Eur J Radiol* 2009; 72: 354–358.
6. Johnson AJ. Radiology report quality: a cohort study of point-and-click structured reporting versus conventional dictation. *Acad Radiol* 2002; 9: 1056–1061.
7. Hobby JL, Tom BD, Todd C, Dixon AK. Communication of doubt and certainty in radiological reports. *Br J Radiol* 2000; 73: 999–1001.
8. Iyer VR, Hahn PF, Blaszkowsky LS, Thayer SP, Halpern EF, Harisinghani MG. Added value of selected images embedded into radiology reports to referring clinicians. *J Am Coll Radiol* 2010; 7: 205–210.
9. Reiner B, Siegel E. Radiology reporting: returning to our image-centric roots. *AJR Am J Roentgenol* 2006; 187: 1151–1155.
10. Johnson AJ, Chen MY, Swan JS, Applegate KE, Littenberg B. Cohort study of structured reporting compared with conventional dictation. *Radiology* 2009; 253: 74–80.
11. Plumb AA, Grieve FM, Khan SH. Survey of hospital clinicians' preferences regarding the format of radiology reports. *Clin Radiol* 2009; 64: 386–396.
12. Bosmans JM, Weyler JJ, De Schepper AM, Parizel PM. The radiology report as seen by radiologists and referring clinicians. Results of the COVER and ROVER surveys. *Radiology* 2011; 259: 184–195.
13. Uçok O. The importance of reporting in oral and maxillofacial radiology. *J Oral Maxillofac Radiol* 2015; 3: 31–32.
14. European Society of Radiology (ESR). Good practice for radiological reporting. Guidelines from the European Society of Radiology (ESR). *Insights Imaging* 2011; 2: 93–96.
15. Dunnick NR, Langlotz CP. The radiology report of the future: a summary of the 2007 Intersociety Conference. *J Am Coll Radiol* 2008; 5: 626–629.
16. Srinivasa Babu A, Brooks ML. The malpractice liability of radiology reports: minimizing the risk. *Radiographics* 2015; 35: 547–554.
17. Powell DK, Silberzweig JE. State of structured reporting in radiology, a survey. *Acad Radiol* 2015; 22: 226–233.
18. Siström C, Lanier L, Mancuso A. Reporting instruction for radiology residents. *Acad Radiol* 2004; 11: 76–84.
19. Steele JL, Nyce JM, Williamson KB, Gunderman RB. Learning to report. *Acad Radiol* 2002; 9: 817–820.
20. diagnostic imaging. (homepage on the internet). Howl-Whitney LJ. Radiology reports: are structured systems the answer? RSNA 2013, Diagnostic Imaging, Practice

Management [updated December 2013]. Available from: <http://www.diagnosticimaging.com/rsna-2013/radiology-reports-are-structured-systems- answer?>

21.Lam CZ, Nguyen HN, Ferguson EC. Radiology resident' satisfaction with their training and education in the United States: effect of program directors, teaching faculty, and other factors on program success. *AJR Am J Roentgenol* 2016; 206: 907-916.

22.Sistrom CL, Langlotz CP. A framework for improving radiology reporting. *J Am Coll Radiol* 2005; 2: 159–167. ^[L]_[SEP]

23.Alan O, Savcı G. Preferences of radiologists, clinicians and patients in informing of patients about radiological reports. ^[L]_[SEP]Survey study. PhD, Uludag University Faculty of Medicine, Department of Radiology, Bursa, Turkey, 2012.

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Appendix

The survey

1. Age:

2. Sex: Female Male

3. Institution:

Academic degree: Resident Lecturer Assistant Professor
Associate Professor Professor Specialist

4. How many years have you worked at radiology department? (including PhD and specialized)

0 - ≤6 month 6 month> - ≤1 year 1> - ≤5 years
5> - ≤10 years More 10 years

5. How many years have you written report?

I have not written report 0 - ≤6 month 6 month> - ≤1 year
1> - ≤5 years 5> - ≤10 years More 10 years

6. Which sources did you use during your training as radiologist how to make a good report?

Teaching staff Article
 More senior trainees Course No education

7. Which format have you used in radiology report construction?

Free text format
Structured report (divided standardizes headings like clinical information, findings, impressions etc.)

8. Do the patients want verbal information about findings after examination?

Often Sometimes Never

9. Do your radiology reports consist of separate paragraphs such as clinical information, findings and the conclusion?

Yes No

10. Do your radiology reports end with a conclusion?

Yes No

11. Do your radiology reports include technical details?

Yes No

12. Should radiology training programs include radiology report construction?

Yes No

13. How a language have you use when you write report?

I use medical language including radiologic terminology.
 I use common words with clinicians to read the radiology report more easily.
 I use simple, basic language which community understand.

14. Which examinations do you report? (for medical radiologists)

Ultrasound Magnetic resonance imaging Computed tomography Conventional methods

15. Which examinations do you report? (for dentomaxillofacial radiologists)

Periapical radiograms Panoramic Radiograms Cone-beam computed tomography
Ultrasound Others (Temporomandibular Joint Graphy, Cephalography etc.)