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Research Paper

Postgraduate research trends in oral and Maxillofacial Radiology in Turkey

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ABSTRACT

Technological and scientific developments in the field of dentistry will affect research trends in this field. It is thought that analyzing the content and research methods of studies in certain fields guides researchers interested in the relevant field. Studying post graduate studies in oral and maxillofacial radiology is considered a contribution in identifying research gaps in the field and guiding future research. This is a descriptive study. In this context, the post graduate studies have been examined by using document analysis method and the research trends in the field of oral and maxillofacial radiology have been described. When we evaluate the research methods used in the theses, it is seen that the studies are mostly conducted with non-experimental methods, there are few experimental studies and mixed studies are not conducted in this field. When we evaluated the data collection tools in the dissertations made between the relevant years, it was seen that the data collection process was mostly applied by the observation method, the samples were mostly composed of patients with no age range and that they were studied with small samples. In this case, we can say that the generalizability of the research results will be low. Based on the research results, we can say that it is necessary to work with large sample groups and include experimental studies in order to increase experimental and mixed method researches in the relevant field, to increase the generalizability of research results and to reach more reliable results.

Key words: Oral and Maxillofacial radiology, Postgraduate research trends.

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INTRODUCTION

It is an unquestionable fact that scientific researches differ according to the necessities of the period in which they are conducted. Scientific developments and changes bring along important variations in the formation of new approaches specific to certain disciplines, in the study of new subjects and use of new tools. Scientific developments also guide an important process that affects the tendencies and orientations of scientific researches. It is desired that scientific and technological developments experienced in the field of medicine and dentistry support the studies in these fields within the integrity of education and that these studies are carried out in harmony with these developments. It has been stated by Cohen, Manion and Morrison that analysing the existing studies in any scientific field in terms of content and method will guide the scientists who conduct studies in that field (Cohen et al., 2007). The research trend refers to the change observed in the studies over time as well as the orientation of this change (Ozan and Köse, 2014). It has been expressed by Lee, Wu, and Tsai that the current status and research trends in their field will assist researchers in their careers and academic publications (Lee et al., 2020). The results of scientific studies are of great importance in terms of affecting policies and practices in all fields of science. These results provide an empirical basis for practices and are also used by the practitioners as a guide for their professional activities (Seçer et al., 2014). It is believed that the examination of postgraduate studies in a scientific field is very important in terms of determining the studies that have been done and need to be done in this field (Veyis,

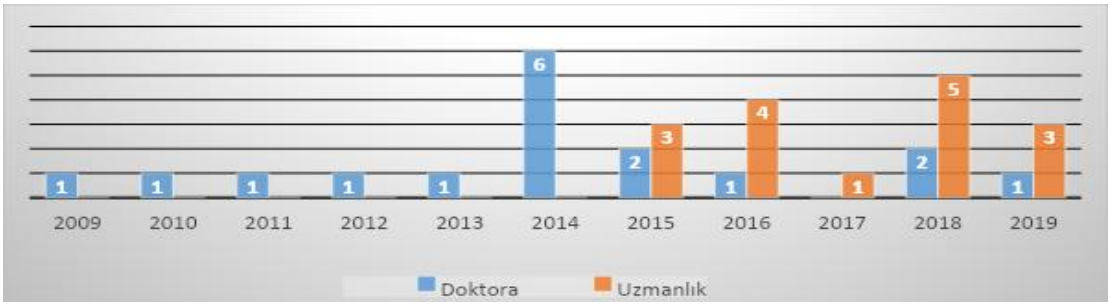

Figure 1: Distribution of examined doctoral and specialty dissertations by years.

2020). Examination of postgraduate studies conducted on oral and maxillofacial radiology is considered very significant for determining the researches that have been done and needs to be done in this field and for guiding the future researches. There are eighty-five universities having graduate programs on oral and maxillofacial radiology as well as fifteen universities providing doctoral and specialty post-graduate education in our country. Regardless of the quantity, it is considered that the quality of the researches and postgraduate studies conducted in these institutions is more important with regard to oral and maxillofacial radiology.

MATERIALS AND METHODS

This is a descriptive study. In this context, the postgraduate studies have been examined by using document analysis method and the research trends in the field of oral and maxillofacial radiology have been described. The data of the study consists of dentistry doctoral and specialty dissertations (DUS) conducted in the field of oral and maxillofacial radiology between the years 2009-2019 and which are available within the database of Turkish Council of Higher Education (YÖK). Dissertations that are not found in full text or that are restricted within YÖK Dissertation Database were not included in the study. Since all dissertations within YÖK Database will be included herein, this study is a complete inventory study (Karasar, 2009). Each dissertation was subjected to a content analysis using the "Oral and Maxillofacial Radiology Dissertation Classification Form". The "Article Classification Form" developed by Sözbilir and Kutu (2008) was revised by the researcher and arranged according to the purpose to be used in the study. The revised form was examined by experts in the field of oral and maxillofacial radiology and the face validity of the form was ensured. In the research, each dissertation was examined using the "Oral and Maxillofacial Radiology Dissertation Classification Form" and then the frequency and percentage distributions were provided using the SPSS program. Among the information on the Dissertation Classification Form; the identity of dissertation, in which university and in which year it was conducted, the research design / method, data collection tools, sampling and data analysis techniques, the subject area as well as the applied devices and equipment were all examined with descriptive analysis and dissertations were classified according to predetermined categories. The "content analysis" technique was used for the subject of the dissertation. The purpose of content analysis is to gather the similar data within the framework of certain concepts and themes and to organize and interpret them in a way that the reader can understand (Yıldırım and Şimşek, 2011). The analysis results of the research were expressed in terms of frequency and percentage values.

RESULTS

When Figure 1 is analysed, it is observed that the number of doctoral dissertations is higher in 2014, 2015, 2018 and the number of specialty dissertations is higher in 2015, 2016, 2018 and 2019 but both are less in other years. It was also discovered that there is no specialization dissertation which is open to access in 2009, 2010, 2011, 2012 and 2013. According to Table 1, we see that Ondokuz Mayıs University and Atatürk University are the leading universities in which most dissertations were conducted in the field of oral and maxillofacial radiology. Selçuk and Gazi Universities follow these universities. It was found out that the number of dissertations in the field of oral and maxillofacial radiology is quite low in other universities. When we examine the table in terms of doctoral dissertations, we see that more doctoral dissertations have been conducted in Atatürk and Selçuk universities. When we examine Table 2, in which the findings about the methods of these dissertations are given, we see that the non-experimental descriptive survey method (70.58% doctoral, 88.23% specialty) is the most preferred one in quantitative studies. When we look at other non-experimental research methods, relational survey (5.88%) and comparative (11.76%) studies were encountered in doctoral dissertations. Among the experimental research

Table 1: Distribution of examined doctoral and specialty dissertations by universities.

Number	University	Type of Dissertation	Number of Dissertation	Total Number
1	Ondokuz Mayıs University	Doctoral	1[9]	6
		Specialty	5[10,11,12,13,14]	
2	Atatürk University	Doctoral	5[15,16,17,18,19]	5
		Specialty	0	
3	Selçuk University	Doctoral	3[20,21,22]	4
		Specialty	1[23]	
4	Gazi University	Doctoral	2[24,25]	2
		Specialty	0	
5	Kırıkkale U. and Ankara U. Joint Program	Doctoral	2[26,27]	2
		Specialty	0	
6	Hacettepe University	Doctoral	0	2
		Specialty	2[28,29]	
7	Marmara University	Doctoral	0	2
		Specialty	2[30,31]	
8	İstanbul University	Doctoral	0	2
		Specialty	2[32,33]	
9	İzmir Katip Çelebi University	Doctoral	1[34]	2
		Specialty	1[35]	
10	Erciyes University	Doctoral	1[36]	2
		Specialty	1[37]	
11	Yeditepe University	Doctoral	1[38]	1
		Specialty	0	
12	Necmettin Erbakan University	Doctoral	0	1
		Specialty	1[39]	
13	Kırıkkale University	Doctoral	0	1
		Specialty	1[40]	
14	Gaziantep University	Doctoral	0	1
		Specialty	1[41]	
15	Ankara University	Doctoral	1[42]	1
		Specialty	0	
	Total Doctoral	17	**Total**	34
	Total Specialty	17		

methods, it is seen that the true experimental method (11.76% doctoral, 11.76% specialty) was mostly used. Qualitative and mixed methods research designs were not encountered in the studies examined.

In Table 3, it is observed that the data collection tools mostly preferred in postgraduate studies in the field of oral and maxillofacial radiology are documents (f = 7 doctoral, f = 11 specialty). Documents are followed by participant observations (f = 8 doctoral, f = 6 specialty). It was found that Likert type surveys were used in 2 doctoral dissertations. On the other hand, it was observed that other data collection techniques were not preferred. Table 4 provides information about the sample groups of postgraduate studies and we see that "no range"(f = 6 doctoral) is mostly preferred as the sample group in doctoral dissertations. On the other hand, it was found that patients aged 18 and above have been preferred more in specialty dissertations. When Table 5 is examined, it is seen that the sample size of postgraduate studies is mostly between 31-100. It was found out that mostly smaller sample groups were used in these dissertations. Table 6 shows that non-parametric (f = 10 specialty, f = 10 doctoral) methods were mostly used as the data analysis technique in postgraduate dissertations conducted within the field of oral and maxillofacial radiology. We also observe that this analysis technique is followed by Anova (f = 4 specialty, f = 6 doctoral), t-test (f = 7 specialty, f = 5 doctoral) and percentage/frequency (f = 5 specialty, f = 3

Table 2: Distribution of doctoral and specialty dissertations by pattern/method.

			Doctoral		Specialty	
Research Pattern		**Research Method**	**f**	**%**	**f**	**%**
Qualitative	Experimental	Real Experimental	2	11.76	2	11.76
		Quasi Experimental	--	--	--	--
		Poor Experimental	--	--	--	--
		Single Subject	--	--	--	--
		Subtotal	**2**	**11.76**	**2**	**11.76**
	Non- Experimental	Descriptive Survey	12	70.58	15	88.23
		Relational Survey	1	5.88	--	--
		Comparative	2	11.76	--	--
		Structural Equation Model	--	--	--	--
		Subtotal	**15**	**88.23**	**15**	**88.23**
Qualitative	Interactive	Culture Analysis	--	--	--	--
		Phenomenology	--	--	--	--
		Theory Formation	--	--	--	--
		Sample Case (Case Study)	--	--	--	--
		Critical Study	--	--	--	--
		Action Research	--	--	--	--
		Subtotal	**0**	**--**	**0**	**--**
	Non- Interactive	Concept Analysis	--	--	--	--
		Historical Analysis	--	--	--	--
		Meta Analysis	--	--	--	--
		Document Review	--	--	--	--
		Subtotal	**0**	**--**	**0**	**--**
Mixed	Mixed	Explanatory	--	--	--	--
		Exploratory	--	--	--	--
		Diversification	--	--	--	--
		Subtotal	0	--	0	--
		Total	**17**	**100**	**17**	**100**

doctoral) techniques. On the other hand, it was discovered that correlation was used in 3 doctoral and 2 specialty dissertations and Regression Analysis (Ancova) was used in 1 doctoral dissertation. Other analysis techniques were not encountered in the selected dissertations.

When the distribution of postgraduate studies in the field of oral and maxillofacial radiology based on their subjects is analysed as shown in Table 7, it is observed that the doctoral dissertations have been mostly conducted on the following subjects: maxillary sinus and paranasal sinus (f = 3), TMJ (f = 2), age determination (f = 2), oral cancers (f = 2), anatomical formations in the mandible (f = 2), anatomical formations in the maxilla (f = 2), bone structures in the maxilla and mandible (f = 2), sleep apnoea (f = 1), malposition and malformations (f = 1), bruxism (f = 1) and anxiety (f = 1). On the other hand, the specialty dissertations were found to be conducted on the following topics: temporomandibular joint disorders (f = 4), anatomical formations in the mandible (f = 4), maxillary sinus and paranasal sinus (f = 2), malposition and malformations in teeth (f = 1), age determination (f = 1), oral cancers (f = 1), joint muscles (f = 1), anatomical formations in the maxilla (f = 1), styloid complex and morphology (f = 1), image defects (f = 1). When the imaging tools used while conducting postgraduate dissertations within the field of oral and maxillofacial radiology is examined according to Table 8, it is observed that the imaging method that has been mostly used in doctoral and specialty dissertations is CBCT (f = 10 doctoral, f = 11 specialty). The conventional radiography (f = 5), MR (f = 2), digital - panoramic (f = 1), CT (f = 1) and non-radiographic (f = 1) imaging methods were also used in doctoral dissertations. On the other hand; the imaging methods used in specialty dissertations are digital-panoramic imaging (f =

Table 3: Data collection tools for doctoral and specialty dissertations.

		Doctoral	Specialty
Category	**Sub-Category**	**f**	**f**
Observation	Participant	8	6
	Non-Participant	--	--
	Total	**8**	**6**
Interview	Structured	--	--
	Quasi-Structured	--	--
	Non-Structured	--	--
	Focus Group	--	--
	Total	**0**	**0**
Achievement Test	Open Ended	--	--
	Multiple Choice	--	--
	Other	--	--
	Total	**0**	**0**
Ability / Personality Test	Open Ended	--	--
	Multiple Choice	--	--
	Other	--	--
	Total	**0**	**0**
Survey/Scale	Open Ended	--	--
	Likert	2	--
	Other	--	--
	Total	**2**	**0**
Documents		7	11
Complementary Alternative Assessment		--	--
Other		--	--
	Total	**7**	**11**

Table 4: Sample groups of doctoral and specialty dissertations.

	Doctoral	**Specialty**
Age Range of Patients	**f**	**f**
Cadaver	1	0
No range	6	1
Between 5-15	1	0
12 and above	0	1
15 and above	2	0
16 and above	2	2
17 and above	0	2
18 and above	2	8
20 and above	3	3
Total	**17**	**17**

2), conventional radiography (f = 1), intraoral radiography (f = 1) and MR (f = 1). The distribution of average number of references cited by postgraduate dissertations within the field of oral and maxillofacial radiology by subject is given

Table 5: Sample size of doctoral and specialty dissertations.

	Doctoral		Specialty	
Sample Size	**f**	**%**	**f**	**%**
Between 1-10	1		0	
Between 11-30	1		0	
Between 31-100	7		4	
Between 101- 300	5		4	
Between 301-1000	3		6	
More than 1000	0		3	
Total	**17**		**17**	

Table 6: Data analysis techniques of doctoral and specialty dissertations.

		Doctoral	Specialty
Category	**Sub-Category**	f	F
Descriptive	Frequency/Percent	3	5
	Average/Standard Deviation	--	--
	Graphic Representation	--	--
	Total	**3**	**5**
Predictive	Correlation Analysis	3	2
	t-test	5	7
	Anova (Analysis of Variance)	6	4
	Ancova (Analysis of Covariance)	--	--
	Manova (Multivariate analysis of variance)	--	--
	Mancova (Multivariate analysis of covariance)	--	--
	Factor Analysis	--	--
	Regression Analysis	1	
	Non-parametric Tests	10	10
	Structural Equation Modeling	--	--
	Other	--	--
	Total	**25**	**23**
Qualitative	Content Analysis	--	--
	Descriptive Analysis	--	--
	Other	--	--
	Total	**--**	**--**

in Table 9. It is observed that the dissertations using the highest number of references had been conducted on anatomical formations in the mandible (f = 216) while the least number of references was used in the dissertations conducted on anxiety (f = 98).

DISCUSSION

Based on the research findings, it is observed that there has been an increase in the total number of dissertations conducted within the field of oral and maxillofacial radiology in recent years. Furthermore, it was concluded that "Ondokuz Mayıs", "Atatürk" and "Selçuk" Universities are the leaders in terms of the number of dissertations conducted by universities and that more dissertations were conducted in these universities when compared to the others. When we examine the research methods used in these dissertations, we observe that these were mostly conducted with non-experimental methods while there were very few experimental ones and it is also seen that mixed studies based on qualitative and quantitative data collection have never been conducted in this field. When we examine the data collection tools used in these dissertations conducted between the mentioned years, we can say that the data were mostly collected by means of

Table 7: Distribution of doctoral and specialty dissertations in the field of oral and Maxillofacial radiology by subject.

	Doctoral	Specialty
	f	f
Age Determination	2	1
Temporomandibular Joint Disorders	2	4
Oral Cancers	0	1
Anatomical Formations in the Mandible	2	4
Malposition and Malformations in Teeth	1	1
Maxillary Sinus and Paranasal Sinus	3	2
Joint Muscles	0	1
Anatomical Formations in the Maxilla	2	1
Styloid Complex and Morphology	0	1
Bone Structures in the Maxilla and Mandible	2	0
Image Defects	0	1
Sleep Apnoea	1	0
Bruxism	1	0
Anxiety	1	0
Total	17	17

Table 8: Imaging methods of doctoral and specialty dissertations.

	Doctoral	Specialty
	f	f
Conventional radiography	5	1
Intraoral radiography	0	1
Digital - panoramic imaging	1	2
CT	1	0
CBCT	10	11
MR	2	0
Ultrasonography	0	1
Non-radiographic imaging	1	0
Total	20	16

Table 9: Distribution of average number of references cited by doctoral and specialty dissertations by subject.

	Doctoral	Specialty
	Average Number of References	Average Number of References
Age Determination	196	145
Temporomandibular Joint Disorders	164	153
Oral Cancers	0	125
Anatomical Formations in the Mandible	216	110
Malposition and Malformations in Teeth	106	178
Maxillary Sinus and Paranasal Sinus	156	149
Joint Muscles	0	228
Anatomical Formations in the Maxilla	146	115
Styloid Complex and Morphology	0	74
Bone Structures in the Maxilla and Mandible	168	0
Image Defects	0	75
Sleep Apnoea	138	0
Bruxism	158	0
Anxiety	98	0
Total	**1446**	**1352**

observation technique. It is seen that the samples in these dissertations are mostly composed of patients whose age range was not provided and the sample size was mostly less than 1000. This situation, in other words, conducting these dissertations with smaller samples reduces the generalizability of the research results. When we examine the subjects in these dissertations have been conducted, we see that the subjects that have been mostly studied were “maxillary sinus and paranasal sinus” in doctoral dissertations while “temporomandibular joint disorders”, “anatomical formations and bone structures in maxilla and mandible” have been mostly studied in specialty dissertations. It was concluded that CBCT was mostly used as the imaging method while conducting research. This shows that current technologies are widely used in the field. When we examine the average number of references cited within these dissertations, we see that the highest number of references were cited in doctoral dissertations conducted on "anatomical formations in the mandible" while in the specialty dissertations, the highest number of references were cited in those conducted on “joint muscles”.

CONCLUSION

Based on the results of the study, the following are recommended: increasing experimental and mixed methods research designs in the mentioned field, studying with larger sample groups in order to increase the generalizability of the research and to reach more reliable results, defining the sample groups used in the research well, disseminating the studies in which more than one imaging method such as MR and Ultrasonography are used, conducting research not only on dentistry but also on basic-clinical medicine and multidisciplinary studies involving educational elements and areas such as psychology or sociology.

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