



ISSN: 2347-6567

International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

IJAMSCR |Vol.14 | Issue 2| Apr - Jun – 2026

www.ijamscr.com

DOI :<https://doi.org/10.61096/ijamscr.v14.iss2.2026.963-968>

Application of Magnetic Resonance Imaging in Dentistry

Dr.A.JayaHarshitha^{1*},Dr.K.V.N.RPratap²,Dr.B.Vengal Rao³,Dr.V.SrujanKumar⁴,Dr.K.Darshikachandini⁵

¹-Student, Department of public health dentistry, Mamata dental college, khammam, India.

²-Professor and HOD, Department of public health dentistry, Mamata dental college, khammam, Indian

³-Professor, Department of public health dentistry, Mamata dental college, khammam,India.

⁴-Reader, Department of public health0- dentistry, Mamata dental college, khammam, India.

⁵-Senior lecturer, Department of public health dentistry, Mamata dental college, khammam, India

*Corresponding Author: Dr.A.JayaHarshitha

Email id: harshithanaikajmeera@gmail.com



Published on:
21.05.2026

Published by:
Futuristic Publications
2026| All rights
reserved.



Creative Commons
Attribution 4.0
International License.

Abstract: Magnetic Resonance Imaging (MRI) is an advanced diagnostic imaging modality that has gained increasing importance in dentistry due to its superior soft tissue contrast, multiplanar imaging capability, and absence of ionizing radiation. Unlike conventional radiographic techniques such as X-rays and computed tomography (CT), MRI provides detailed visualization of both hard and soft tissues, making it particularly valuable in various dental specialties. In oral and maxillofacial radiology, MRI is widely used for the evaluation of temporomandibular joint (TMJ) disorders, salivary gland pathologies, cysts, tumors, and inflammatory lesions. It also plays a significant role in endodontics, implant planning, orthodontics, and assessment of craniofacial anomalies. **AIM:**To assess the knowledge, awareness, and understanding of the applications of Magnetic Resonance Imaging (MRI) in dentistry among dental students/practitioners. **OBJECTIVES:**To evaluate the level of knowledge regarding the principles and uses of MRI in dentistry. To assess awareness about various dental applications of MRI, such as temporomandibular joint (TMJ) imaging, soft tissue evaluation, salivary gland imaging, and implant planning. To determine the understanding of advantages and limitations of MRI compared with other imaging modalities used in dentistry. To assess awareness regarding the safety aspects and contraindications of MRI. **METHODOLOGY:**This bibliometric analysis was conducted using data retrieved from the Web of Science Core Collection (WoSCC) database. A targeted search query was formulated to focus on the application of Magnetic Resonance Imaging in Dentistry. **RESULTS:**A total of 208 students took part in this with females(55) and males(44) Age of the participants ranging from 19-24 yrs. Females were more likely to demonstrate perception than male. Significantly second years showed greater familiarity. **CONCLUSION:** This bibliometric analysis demonstrates a sustained expansion of dental MRI research from 2000 to 2024, with output accelerating after 2010 and coalescing into a mature, multidisciplinary field. Consequently, routine placement of MRI units within standalone dental clinics is unlikely in the near term.

Keywords:Magnetic Resonance Imaging, Dentistry, Bibliometric Analysis.

1. INTRODUCTION

Magnetic Resonance Imaging (MRI) has emerged as a transformative imaging modality in the field of dentistry, offering superior soft tissue contrast, high spatial resolution, and the advantage of radiation-free

imaging. These characteristics have introduced new opportunities for dental diagnosis and treatment planning, particularly in cases requiring precise evaluation of soft tissue structures such as the temporomandibular joint (TMJ), salivary glands, and oral mucosa. Unlike traditional imaging methods, MRI enables clinicians to visualize complex maxillofacial anatomy without exposing patients to ionizing radiation.

AIM:

To assess the awareness and application of Magnetic Resonance Imaging in Dentistry.

2. METHODOLOGY

Study Design: A descriptive cross-sectional questionnaire-based study.

Study Population: Participants will include undergraduate dental students (second year to Final year) willing to participate in the study.

Sampling Method: Convenience sampling/simple random sampling may be used to recruit participants.

Data Collection Tool: A structured, self-administered questionnaire will be prepared

consisting of: Demographic details (age, gender, year of study)

Questions assessing awareness of MRI knowledge regarding applications of MRI in dentistry Attitude toward the use of MRI in dental practice.

Inclusion Criteria: Undergraduate dental students willing to participate

Students present during data collection Exclusion Criteria:

Students unwilling to participate incomplete questionnaires

RESULTS:

A total of 208 students took part in this with females(55%) and males(44%) Age of the participants ranging from 19 -24 yrs. In this study females were more likely to demonstrate perception than male. Significantly second years showed greater familiarity with advanced applications than third and fourth year students.

AGE					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	208	19	24	22.34	1.457
GENDER					
			Frequency		Percent
	MALE		92		44.2
	FEMALE		116		55.8
	Total		208		100.0
YEAR OF STUDY					
			Frequency		Percent
	II BDS		75		36.0
	III BDS		73		35.0
	IV BDS		60		29.0
	Total		208		100.0

Distribution and comparison of responses based on gender:

$P \leq 0.05$ is statistically significant

Item	Response	Males		Females		Chi-Square value	P value
		n	%	n	%		
Q1	1	18	62.0	11	38.0	4.546	0.04*
	2	41	39.4	63	60.6		
	3	22	44.0	28	56.0		
	4	11	44.0	14	56.0		
Q2	1	66	44.8	81	55.2	2.464	0.06

	2	6	33.3	12	66.7		
	3	20	46.5	23	53.5		
Q3	1	57	40.7	83	59.3	1.920	0.589
	2	7	29.2	17	70.8		
	3	16	47.1	18	52.9		
	4	6	42.9	8	57.1		
Q4	1	6	33.3	12	66.7	0.697	0.874
	2	8	36.4	14	63.6		
	3	9	39.1	14	60.9		

	4	63	42	87	58		
Q5	1	1	12.5	7	87.5	2.930	0.402
	2	8	47.1	9	52.9		
	3	6	40	9	60		
	4	71	41	102	59		
Q6	1	75	42.6	109	57.4	3.720	0.05*
	2	5	21.7	1	78.3		
	3	4	66.6	2	33.3		
	4	2	50	2	50		
Q7	1	74	40	111	60	1.489	0.475
	2	10	40.7	15	59.3		
	3	1	1.2	0	0		
	4	1	50	1	50		
Q8	1	8	33.3	16	66.7	3.980	0.409
	2	2	16.7	10	83.3		
	3	13	46.4	15	53.6		
	4	11	40.7	16	59.3		
Q9	1	80	41.2	104	58.8	0.671	0.413
	2	3	31.6	13	68.4		
	3	2	25	6	25		
	4	1	20	4	80		
Q10	1	5	25	15	75	7.241	0.065
	2	73	42.9	97	57.1		
	3	7	53.8	6	46.2		
	4	1	10	9	90		
Q11	1	8	53.3	7	46.7	2.655	0.448
	2	8	36.4	14	63.6		
	3	9	30	21	70		
	4	61	41.8	85	58.2		
Q12	1	2	18.2	9	81.8	6.418	0.093
	2	69	45.1	84	54.9		
	3	8	25.8	23	74.2		
	4	7	38.9	11	61.1		
Q13	1	62	42.8	83	57.2	2.311	0.510
	2	6	26.1	17	73.9		
	3	11	39.3	17	60.7		
	4	7	41.2	10	58.8		
Q14	1	6	37.5	0	62.5	0.221	0.974
	2	5	38.5	8	61.5		
	3	7	36.8	12	63.2		
	4	6	41.2	96597	58.8		
Q15	1	3	23.1	10	76.9	1.793	0.616
	2	70	44.4	100	55.6		
	3	11	68.7	5	31.3		

	4	8	41.2	1	58.8				
Distribution and comparison of responses based on year of the study:									
Item	Response	II BDS		III BDS		IV BDS		Chi-Value	P-Value
		n	%	n	%	n	%		
Q1	1	4	33.3	4	33.3	4	33.3	3.648	0.03*
	2	5	42.1	41	32	33	25.7		
	3	1	27.5	12	30.0	17	42.5		
	4	6	21.4	16	57.1	6	21.4		
Q2	1	7	38.8	68	37.7	42	23.3	8.474	0.05*
	2	3	16.7	4	22.2	11	61.1		
	3	2	20	1	10	7	70		
Q3	1	5	39.3	58	41.4	27	19.3	21.445	0.002*
	2	4	16.7	6	25	14	58.3		
	3	1	35.3	12	35.3	10	29.4		
	4	1	7.1	8	57.1	5	35.7		
Q4	1	5	27.8	7	38.9	6	33.3	27.128	0.0001*
	2	2	9.1	6	27.3	14	63.6		
	3	7	30.4	6	26.1	10	43.5		
	4	5	39.3	65	43.3	26	17.3		
Q5	1	3	37.5	3	37.5	2	25	12.714	0.048*
	2	5	29.4	5	29.4	7	41.2		
	3	2	13.3	4	26.7	9	60		
	4	6	36.4	72	41.6	38	22		
Q6	1	6	34.7	77	40.5	47	24.7	2.257	0.323
	2	7	30.4	7	30.4	9	39.1		
	3	4	11.6	5	11.7	7	9.6		
	4	3	21.7	7	8.7	5	6.6		
Q7	1	6	34.6	74	40	47	25.4	2.712	0.607
	2	8	29.6	10	37	9	33.3		
	3	1	100	0	0	3	6.1		
	4	3	11.6	7	8.5	6	6.7		
Q8	1	9	37.5	10	41.7	5	20.8	34.979	0.001*
	2	1	8.3	2	16.7	9	75		
	3	7	25	6	21.4	15	53.6		
	4	1	51.9	8	29.6	5	18.5		
Q9	1	7	36.1	80	41.2	44	22.7	14.651	0.001*
	2	3	15.8	4	21.1	12	63.2		
	3	4	5.6	6	7.7	8	25.8		
	4	3	4.5	2	6.7	5	27.8		
Q10	1	7	35	7	35	6	30	12.306	0.055
	2	6	37.1	69	40.6	38	22.4		

	3	1	7.7	6	46.2	6	46.2		
	4	2	20	2	20	6	60		
Q11	1	6	40	5	33.3	4	26.7	33.408	0.0001*
	2	3	13.6	3	13.6	16	72.7		
	3	7	23.3	12	40	11	36.7		
	4	5	39	64	43.8	25	17.1		
		7							
Q12	1	1	9.1	4	36.4	6	54.5	14.996	0.020*
	2	5	38.6	63	41.2	31	20.3		
		9							
	3	8	25.8	13	41.9	10	32.3		
	4	5	27.8	4	22.2	9	50		
Q13	1	5	37.2	59	40.7	32	22.1	14.977	0.020*
		4							
	2	5	21.7	8	34.8	10	43.5		
	3	6	21.4	9	32.1	13	46.4		
	4	8	47.1	8	47.1	1	5.9		
Q14	1	3	18.8	7	43.8	6	37.5	17.924	0.006*
	2	3	23.1	1	7.7	9	69.2		
	3	8	42.1	9	47.4	2	10.5		
	4	5	35.8	67	40.6	39	23.6		
		9							
Q15	1	1	7.7	6	46.2	6	46.2	5.647	0.02*
	2	6	39.4	57	36.3	38	24.2		
		2							
	3	6	30.0	3	15.0	11	55.0		
	4	6	33.3	7	38.8	5	27.7		

P≤0.05 is statistically significant

3. DISCUSSION

This bibliometric study demonstrated a significant expansion of research in dental MRI from 2000 to 2024. In the early 2000s, only a limited number of studies explored the application of MRI in dentistry. Oral and maxillofacial oncology is another key area where MRI plays a vital role, particularly in diagnosing and planning treatment for oral cancers and head and neck tumors. MRI's application in implant treatment planning has grown, particularly with advancements in metal artifact suppression and its ability to assess soft tissues without radiation. Moreover, novel MRI contrast agents and functional MRI (fMRI) applications are expanding the scope of dental imaging.

4. CONCLUSION

This bibliometric analysis demonstrates a sustained expansion of dental MRI research from 2000 to 2024, with output accelerating after 2010 and coalescing into a mature, multidisciplinary field. At the same time, MRI's benefits in dentistry are realized only within properly shielded and well-run MR facilities staffed by trained personnel and governed by rigorous safety protocols. Consequently, routine placement of MRI units within standalone dental clinics is unlikely in the near term.

5. REFERENCE

- [1] Han B, Chen N, Luo J, et al. Magnetic resonance imaging for dental pulp assessment: a comprehensive review. J Magn Reson Imaging JMRI Ito K, Kuno H, Otsuka K, et al. Imaging findings, complications, and mimics after common and advanced
- [2] dental procedures. Radiogr Rev Publ Radiol Soc N Am
- [3] Inc
- [4] Ha E, Jeon K, Lee C, et al. Magnetic resonance image
- [5] generation using enhanced TransUNet in temporomandibular disorder patients.

[6] DENTOMAXILLOFACIAL Radiol