Impact Of Digital Media In Awareness Of Oral Diseases Among Dental Students In Bengaluru, India – A Questionnaire Based Study

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Abstract:
Background: *Digital media has revolutionized the way information is disseminated and consumed, particularly in medical and dental education. With the increasing reliance on online platforms for academic learning, it is crucial to assess how effectively digital media contributes to the awareness of oral diseases among dental students. This study aims to evaluate the extent to which digital media influences knowledge, perception, and attitudes toward oral disease awareness among dental students in Bengaluru, India.*
Materials and Methods: *This questionnaire-based study was conducted among dental students in Bengaluru. A structured, validated questionnaire was distributed digitally, targeting a sample size of 385 students (determined at a 95% confidence level with a 5% margin of error). The questionnaire covered demographic details, sources of information on oral diseases, frequency of digital media usage, and perceived effectiveness of digital platforms in enhancing knowledge. Data was collected anonymously and analyzed using descriptive and inferential statistical methods.*
Results: *This study evaluated the impact of digital media on oral disease awareness among dental students in Bengaluru, India. The findings indicate that digital media plays a significant role in their knowledge and awareness, with a notable proportion of students, such as 66.7% of 2nd-year BDS students, reporting daily usage of digital media for oral health information. YouTube is a preferred platform (e.g., used by 94.1% of interns), highlighting the importance of video-based content. While students acknowledge benefits like easy access to information (up to 99% agreement among interns), concerns exist, including misinformation, which was a concern for 38.8% of 1st-year students. Overall, there's a trend toward increased acceptance of digital tools in dental education, supported by 66.7% of interns.*
Conclusion: *In conclusion, this study highlights the significant role of digital media in influencing oral disease awareness among dental students in Bengaluru. While digital platforms offer valuable educational resources and are widely utilized, there are also challenges, such as the potential for misinformation. The findings suggest a growing recognition of digital media's importance in dental education and future careers, indicating a need for effective integration and critical evaluation of digital resources within dental curricula.*
Key Word: *Questionnaire, Digital media, Bengaluru, Dental students, Oral diseases*

I.   Introduction

The advent of digital media has widely influenced the sharing and consumption of information, particularly in the medical field, including dentistry. The dental students enjoy a plethora of sources of information on the internet, including social media, health blogs, podcasts, and YouTube channels that present up-to-date information on oral health, diseases, prevention, treatment, and trends. Oral infections such as cavities, periodontal disease, and oral cancer are prevalent worldwide health conditions, with billions of people affected, as stated by the World Health Organization [1].

In India, poor awareness about oral health exacerbates these problems, making education and awareness campaigns crucial [2]. Dental students have an important role to play in shaping public perceptions regarding oral hygiene and prevention of diseases [3]. Bengaluru, a major educational and health hub in India, offers an ideal setting to examine the impact of digital media on dental students' knowledge of oral diseases. Since dental students are supposed to acquire theoretical knowledge as well as clinical skills, knowledge about oral diseases is essential for their education and professional career.

The purpose of this study is to evaluate the impact of digital media on the views of oral diseases among Bengaluru's dental students. It will explore their utilization of different digital platforms, the nature of oral health information they gather, and how it impacts their knowledge of oral diseases. The study seeks to establish whether digital media is an effective tool in increasing oral awareness and whether it can be integrated into dentistry curricula in order to augment education, public health, and general healthcare literacy.

II.   Materials And Methods

This cross-sectional, questionnaire-based study was conducted on dental students from 12 dental colleges affiliated to Rajiv Gandhi University of Health Sciences and which were located across various locations in Bengaluru, India (names of dental colleges are kept anonymous), from September 2024 to January 2025. The sample size of 385 was calculated based on an estimated proportion of 0.5 (50%), a relative precision (margin of error) of 5%, and a 95% confidence level. A diverse group of 385 dental students, including interns and students from all undergraduate years (1st to 4th year), participated in the study. Inclusion criteria stipulated that participants must be enrolled in one of the 12 participating colleges and provide consent. Exclusion criteria encompassed incomplete survey responses and responses submitted after the study's completion.

Procedure/Methodology:

At first initial study planning was done by all the authors based on which, a structured questionnaire was developed and validated by a panel of experts from Oral Medicine and Oral Radiology, Oral and Maxillofacial Pathology. The study was carried out through an online survey form prepared with Google forms. The link of the questionnaire form were sent to the participating dental students through e-mail. A cover letter was added summarizing the aims of the study and participants were informed that participation is voluntary and their answers will be kept confidential.

The questionnaire consisted of four sections. The first section consisted of four questions including socio-demographic characteristics such as name of the participating dental student, age, sex, and year of study. The names of the different colleges were kept anonymous as all the colleges participating in this study had common criteria of being affiliated to Rajiv Gandhi University of Health Sciences and were located across various locations in Bengaluru, India. The second section included seven questions that aimed to evaluate the digital media usage among the participants. The third section consisted of six questions that aimed to assess the awareness and knowledge of the participants regarding digital media in dentistry. The fourth section consisted of nine questions that aimed to evaluate the perception and attitude of the participants towards digital media in dentistry.

The data of the study were analyzed with IBM SPSS® program (version 29). Frequency distribution and percentages were used in summarizing categorical data.

III.   Result And Statistical Analysis

Socio-demographic characteristics of the participants:

In total 385 dental students from across 12 dental colleges located across various locations in Bengaluru, India participated in this study and responded to the questionnaire sent to them. The overall mean age of the participants was 21.54 years ± 0.24 years (ranging from 18 years to 27 years and above). Among the total number of participants, 301 (78.20%) were female and 84 (21.8%) were male. When the responses were seen based on year of study of the dental students, 85 (22.80%) were first year students, 69 (17.90%) were second year students, 60 (15.6%) were third year students, 69 (17.90%) were fourth year students and 102 (26.50%) were interns. This diverse responses from various years of undergraduate students and interns makes this study significantly bias-free thereby, resulting a more statistically significant analysis.

Table – 1: Demographic data of participants with percentage of distribution among age, gender and year of study

		Count	Percentage
1) Age	**18-20**	152	39.50%
	21-23	145	37.70%
	24-26	81	21.00%
	27 and above	7	1.80%
2) Gender	**Female**	301	78.20%
	Male	84	21.80%
3) Year of Study	**1st year BDS**	85	22.10%
	2nd year BDS	69	17.90%
	3rd year BDS	60	15.60%
	4th year BDS	69	17.90%
	Intern	102	26.50%

Usage of Digital Media among participants:

Table-2 demonstrates data obtained from the second section of the questionnaire which was aimed to assess the usage of digital media among the participants. Q2.1 was designed for frequency of digital media usage for oral health information. The majority of **students across all study years use digital media daily** for oral health information, with the highest percentage among 2nd-year (66.7%) and 3rd-year (63.3%) BDS students. However, the frequency of **weekly usage** is also significant, especially among interns (42.2%) and 4th-year BDS students (42.0%). Monthly and rarely used categories show very low percentages, indicating that **most students rely heavily on digital media.** The chi-square test ($\chi^2 = 40.21$, p = 0.001) suggests a **statistically significant difference in usage frequency across undergraduate years**.

When asked about preference of digital platforms (Q2.2), **YouTube** was the **most preferred platform** across all study years, with the highest percentage among interns (94.1%) and 4th-year students (92.8%). **Instagram** is also a popular choice, especially among interns (79.4%) and 4th-year students (73.9%). **AI tools** (e.g., ChatGPT) show **increasing adoption in senior years**, peaking at 58% among 4th-year students. **Medical websites and forums** gain higher preference among 3rd-year students (55%) compared to junior years. Facebook and Twitter remain the least utilized platforms. The chi-square test ($\chi^2 = 112.069$, p = 0.001) confirms significant variation in platform preferences among students.

Time spent on digital platforms were assessed (Q2.3), showing varied time investment across different study years. The **highest percentage of students** spending **more than 2 hours daily** is found in **4th-year BDS** (31.9%). The **most common duration is 30 minutes to 1 hour**, especially among interns (52%). Interestingly, **1st-year students tend to spend less than 30 minutes more frequently** (32.9%). The chi-square test ($\chi^2 = 71.79$, p = 0.001) highlights a statistically significant difference in the time spent among different academic years.

The majority of students do not actively participate in online discussions related to oral health (Q2.4), with the highest percentage among 2nd-year students (84.1%). However, participation increases significantly in 4th-year BDS (62.3%), indicating **growing engagement in professional discussions as students advance**. The chi-square test ($\chi^2 = 37.641$, p = 0.001) confirms the significant variance in participation across years. A large proportion of students do not share oral health information on their social media (Q2.5). The highest percentage of non-sharers is among 2nd-year BDS students (84.1%), whereas sharing increases significantly among 4th-year students (52.2%). The trend suggests that as **students' progress in their studies, they gain confidence in sharing their knowledge**. The chi-square test ($\chi^2 = 21.774$, p = 0.001) confirms significant variation.

Most students across all years find online information reliable (Q2.6), with **the highest confidence among 4th-year** (82.6%) and **intern** (79.4%) groups. A small proportion finds it unreliable, with negligible percentages across all study years. A higher percentage of neutral responses are seen in junior years, indicating initial scepticism. The chi-square test ($\chi^2 = 42.551$, p = 0.001) supports significant variation in perceived reliability. **Mobile app usage varies across study years** (Q2.7). The **highest adoption rate is observed in 4th-year BDS** (81.2%), whereas **3rd-year students show the lowest** (40%). The **decreasing trend in non-usage among senior students suggests that they increasingly rely on apps as they advance in their studies**. The chi-square test ($\chi^2 = 27.458$, p = 0.001) confirms statistical significance.

Table – 2: Association of different Year of Study with Section 2 of the questionnaire

Questions	Response	1st year BDS		2nd year BDS		3rd year BDS		4th year BDS		Intern		χ2 value	P value
		N	%	N	%	N	%	N	%	N	%		
2.1) How often do you use digital media (social media, online forums, websites) for information related to oral health?	Daily	41	48.20%	46	66.70%	38	63.30%	38	55.10%	49	48.00%	40.21	0.001*
	Monthly	2	2.40%	2	2.90%	4	6.70%	1	1.40%	8	7.80%		
	Never	1	1.20%	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
	Rarely	13	15.30%	4	5.80%	7	11.70%	1	1.40%	2	2.00%		
	Weekly	28	32.90%	17	24.60%	11	18.30%	29	42.00%	43	42.20%		
2.2 Which digital platforms do you primarily use for oral health Information	Instagram	40	47.10%	35	50.70%	23	38.30%	51	73.90%	81	79.40%	112.069	0.001*
	Twitter or X	5	5.90%	2	2.90%	4	6.70%	2	2.90%	7	6.90%		
	YouTube	69	81.20%	63	91.30%	47	78.30%	64	92.80%	96	94.10%		
	Medical Websites or forums	28	32.90%	13	18.80%	33	55.00%	26	37.70%	46	45.10%		
	AI Tools like ChatGPT	35	41.20%	24	34.80%	32	53.30%	40	58.00%	41	40.20%		
	Facebook	12	14.10%	21	30.40%	2	3.30%	13	18.80%	11	10.80%		
2.3) How much time do you spend on digital media for oral health information per day?	1 hour to 2 hours	10	11.80%	17	24.60%	14	23.30%	27	39.10%	22	21.60%	71.79	0.001*
	30 minutes to 1 hour	24	28.20%	25	36.20%	19	31.70%	13	18.80%	53	52.00%		
	Less than 30 minutes	28	32.90%	12	17.40%	25	41.70%	7	10.10%	9	8.80%		
	More than 2 hours	23	27.10%	15	21.70%	2	3.30%	22	31.90%	18	17.60%		
2.4) Do you participate in online discussions or forums related to oral health?	No	54	63.50%	58	84.10%	46	76.70%	26	37.70%	68	66.70%	37.641	0.001*
	Yes	31	36.50%	11	15.90%	14	23.30%	43	62.30%	34	33.30%		
2.5) Have you ever shared information about oral health on your social media platforms?	No	56	65.90%	58	84.10%	44	73.30%	33	47.80%	68	66.70%	21.774	0.001*
	Yes	29	34.10%	11	15.90%	16	26.70%	36	52.20%	34	33.30%		
2.6) How reliable do you find the information on oral diseases available on digital media?	Neutral	23	27.10%	15	21.70%	15	25.00%	3	4.30%	2	2.00%	42.551	0.001*
	Reliable	50	58.80%	47	68.10%	40	66.70%	57	82.60%	81	79.40%		
	Somewhat unreliable	2	2.40%	0	0.00%	1	1.70%	1	1.40%	4	3.90%		
	Unreliable	1	1.20%	0	0.00%	0	0.00%	0	0.00%	1	1.00%		
	Very Reliable	9	10.60%	7	10.10%	4	6.70%	8	11.60%	14	13.70%		
2.7) Do you use mobile apps related to oral health and diseases?	No	45	52.90%	27	39.10%	36	60.00%	13	18.80%	46	45.10%	27.458	0.001*
	Yes	40	47.10%	42	60.90%	24	40.00%	56	81.20%	56	54.90%		

*Statistical significance set at 0.05; N: Number of samples; χ2 value: Chi-square value

Awareness and Knowledge of the Participants regarding Digital Media in Dentistry:

The third section of the questionnaire was aimed to assess the awareness and knowledge of the students regarding digital media, the data of this section is shown in Table-3. The majority of students across all academic years acknowledge that digital media has improved their awareness of oral diseases (Q3.1). The **highest awareness** is observed in **2nd-year BDS students** (98.6%) and **4th-year students** (97.1%), suggesting that at these stages, students are highly engaged with online dental education resources. However, a relatively lower percentage of interns (81.4%) and 1st-year students (88.2%) believe digital media significantly enhanced their awareness. This suggests that while **digital media is an effective learning tool, its perceived impact may diminish as students advance in their academic journey and rely more on clinical experience**. Students report different levels of knowledge improvement depending on the area of oral health (Q3.2). **Oral cancer awareness** is the **most commonly reported area of improvement**, especially among 3rd-year (50%), 4th-year (73.9%), and intern (68.6%) students. This indicates a **shift toward more complex and serious topics as students' progress in their studies**. On the other hand, prevention of dental caries is the dominant topic for 1st-year (57.6%) and 2nd-year (63.8%) students, reflecting an **early focus on basic oral hygiene and cavity prevention**. Knowledge about periodontal diseases and the management of oral infections remains relatively low, particularly among interns (2% and 15.7%), suggesting that these topics may require more emphasis in digital education. The χ² value of 138.489 and p-value of 0.001 indicate a highly significant variation in the areas of knowledge gained across academic years.

When it comes to sources of digital information (Q3.3), **YouTube is the most preferred platform**, particularly among 1st-year (51.8%), 2nd-year (42%), 4th-year (43.5%), and interns (40.2%). This suggests that **video-based content remains the most accessible and engaging format for learning about oral diseases**. Social media platforms also play a significant role, particularly for interns (50%) and 2nd-year students (46.4%), indicating a **growing reliance on informal yet accessible educational content**. Interestingly, AI tools like ChatGPT gain more popularity among 3rd-year (18.3%) and 4th-year (11.6%) students, highlighting a **trend toward AI-driven learning in senior years**. Medical websites and online courses, however, have relatively low engagement, with only 7.8% of interns and 7.2% of 4th-year students preferring medical websites. The χ² value

of 60.537 and p-value of 0.001 confirm that the choice of digital learning platforms significantly differs among students at different academic levels.

The frequency with which students verify information obtained from digital media varies across study years (Q3.4). A **considerable number of students verify information sometimes or often**, with **4th-year BDS** (52.2%) and **interns** (44.1%) showing the **highest tendency toward occasional verification**. However, **1st-year** (8.2%) and **3rd-year** (13.3%) students are **more likely to verify information always**, whereas **interns** (2.9%) and **2nd-year students** (1.4%) are the **least likely to do so**. The number of students who rarely or never verify digital information is highest among 2nd-year BDS (31.9%) and interns (29.4%), indicating a **decline in fact-checking habits as students gain more confidence in their knowledge**. The χ^2 value of 28.497 and p-value of 0.028 suggest a statistically significant but less pronounced difference in verification habits among students. Participation in online webinars and courses on oral health varies among students (Q3.5). The highest attendance is recorded among 4th-year BDS students (52.2%), indicating an **increasing interest in structured online learning as students approach graduation**. However, **2nd-year** (85.5%), **3rd-year** (80%), and **interns** (78.4%) report the **highest non-attendance rates**, suggesting that students in these stages may **rely more on traditional academic resources and clinical exposure**. The χ^2 value of 32.557 and p-value of 0.001 indicate a significant difference in webinar participation across different academic levels. This finding suggests that **more efforts should be made to encourage students in their early years and internship periods to engage in structured online learning opportunities.**

Students attribute varying proportions of their oral disease knowledge to digital media. The largest group falls within the **21-40% category**, particularly among **interns (61.8%) and 3rd-year students (55%)**, suggesting that while digital media is an important resource, it is not the primary source of knowledge. **4th-year students (53.6%)** are more likely to attribute **41-60%** of their knowledge to digital media, reflecting a greater reliance on online sources as they near the end of their academic training. The proportion of students who credit **0-20% of their knowledge to digital media** is highest among **1st-year (14.1%) and 3rd-year (13.3%) students**, implying that **in the early years, traditional textbooks and classroom learning still play a dominant role**. Interestingly, very few students (<3% across all years) report that digital media contributes **81-100%** of their knowledge, reinforcing the idea that while digital media is a valuable supplement, it does not replace formal education. The χ² **value of 41.812 and p-value of 0.001** suggest a strong statistical significance in how students from different study years perceive digital media's contribution to their knowledge.

Table – 3: Association of different Year of Study with Section 3 of the questionnaire

Questions	Responses	Year of Study										χ² value	P value
		1st year BDS		2nd year BDS		3rd year BDS		4th year BDS		Intern			
		N	%	N	%	N	%	N	%	N	%		
3.1) Has your awareness of oral diseases improved due to digital media?	No	10	11.80%	1	1.40%	8	13.30%	2	2.90%	19	18.60%	18.249	0.001*
	Yes	75	88.20%	68	98.60%	52	86.70%	67	97.10%	83	81.40%		
3.2) Which area of oral health do you feel most knowledgeable about due to digital media exposure?	Management of oral infections	7	8.20%	5	7.20%	14	23.30%	8	11.60%	2	2.00%	138.489	0.001*
	Oral cancer awareness	19	22.40%	11	15.90%	30	50.00%	51	73.90%	70	68.60%		
	Periodontal health and diseases	10	11.80%	9	13.00%	5	8.30%	7	10.10%	16	15.70%		
	Prevention of dental caries	49	57.60%	44	63.80%	11	18.30%	3	4.30%	14	13.70%		
3.3) Which digital media source do you find most informative for learning about oral diseases?	AI Tools like ChatGPT	10	11.80%	1	1.40%	11	18.30%	8	11.60%	2	2.00%	60.537	0.001*
	Medical websites	12	14.10%	7	10.10%	14	23.30%	5	7.20%	8	7.80%		
	Online courses	3	3.50%	0	0.00%	3	5.00%	0	0.00%	0	0.00%		
	Social media	16	18.80%	32	46.40%	12	20.00%	26	37.70%	51	50.00%		
	YouTube	44	51.80%	29	42.00%	20	33.30%	30	43.50%	41	40.20%		
3.4) How often do you verify the information obtained from digital media with academic sources?	Always	7	8.20%	1	1.40%	8	13.30%	3	4.30%	3	2.90%	28.497	0.028*
	Never	1	1.20%	2	2.90%	1	1.70%	0	0.00%	3	2.90%		
	Often	28	32.90%	18	26.10%	11	18.30%	13	18.80%	21	20.60%		
	Rarely	10	11.80%	22	31.90%	14	23.30%	17	24.60%	30	29.40%		
	Sometimes	39	45.90%	26	37.70%	26	43.30%	36	52.20%	45	44.10%		
3.5) Have you attended any online webinars or courses on oral health?	No	54	63.50%	59	85.50%	48	80.00%	33	47.80%	80	78.40%	32.557	0.001*
	Yes	31	36.50%	10	14.50%	12	20.00%	36	52.20%	22	21.60%		
3.6) What percentage of your knowledge about oral diseases do you attribute to digital media?	0-20%	12	14.10%	4	5.80%	8	13.30%	3	4.30%	1	1.00%	41.812	0.001*
	21-40%	38	44.70%	31	44.90%	33	55.00%	29	42.00%	63	61.80%		
	41-60%	25	29.40%	30	43.50%	16	26.70%	37	53.60%	34	33.30%		
	61-80%	9	10.60%	4	5.80%	2	3.30%	0	0.00%	3	2.90%		
	81-100%	1	1.20%	0	0.00%	1	1.70%	0	0.00%	1	1.00%		

*Statistical significance set at 0.05; N: Number of samples; χ2 value: Chi-square value

Perception and Attitude of participants towards digital media:

The final section of the questionnaire was designed to evaluate the perception and attitude of the dental students towards digital media. The data obtained from this section of the questionnaire is demonstrated in Table – 4. The majority of students across all academic years believe that digital media plays a significant role in raising public awareness about oral diseases (Q4.1). The percentage of students agreeing with this statement increases as they progress in their studies, from 58.8% in the first year to 76.5% among interns. This trend suggests that **as students gain more knowledge and experience, they recognize the potential of digital media in educating the public**. A statistically significant difference (p=0.002p = 0.002p=0.002) indicates that perspectives on this topic vary across different years of study.

When asked about advantages (Q4.2), many students find visual aids and videos to be useful for learning, with support for this advantage rising from 50.6% in the first year to 82.4% among interns. This indicates that **as students advance in their education, they increasingly rely on multimedia tools for better comprehension**. The high statistical significance (p=0.001p = 0.001p=0.001) reinforces this finding. The **ease of access to information is one of the most widely accepted benefits** of digital media, with agreement levels increasing from 72.9% in the first year to 99% among interns. This nearly universal acceptance highlights the importance of digital platforms in providing quick and convenient access to knowledge. Keeping up with the latest advancements in dentistry is essential, and digital media is recognized as an effective tool for this purpose. The percentage of students who believe that digital media provides up-to-date content grows from 47.1% in the first year to 88.2% among interns, indicating that **senior students rely more on digital sources for updated information**. While interactive learning is considered a benefit, fewer students in higher academic years view it as a major advantage. The percentage drops from 29.4% in the first year to only 5.8% in the fourth year. This decline may suggest that **as students' progress, they prefer more structured and traditional learning approaches over interactive digital methods**.

On the other hand, disadvantages of the digital media were also assessed (Q4.3). **Misinformation and the lack of credible sources** are **significant concerns** among students, especially **in the earlier years of study**. In the first year, 38.8% of students express concerns about misinformation, but this figure declines to 12.7% among interns. This trend suggests that **as students gain more experience, they develop better skills in discerning reliable sources from misleading content**. The statistically significant difference (p=0.001p = 0.001p=0.001) highlights the importance of improving digital literacy among early-year students. Digital media is widely regarded as a potential distraction from academic studies, with concerns increasing from 50.6% in the first year to 96.1% among interns. This **growing concern** suggests that while **digital platforms** offer valuable learning resources, they also **pose challenges in maintaining focus and academic discipline**. As students' progress in their education, they increasingly feel overwhelmed by the vast amount of information available through digital media. The percentage of students citing information overload as a disadvantage rises from 34.1% in the first year to 87.3% among interns. This highlights the **need for effective filtering and organization of digital content to enhance learning efficiency.**

Perspectives on traditional learning methods compared to digital media (Q4.4) evolve throughout dental education. In the first year, 43.5% of students believe that traditional learning methods (such as textbooks and lectures) are more effective. However, this percentage declines to 27.5% among interns. Conversely, the percentage of students who disagree with this statement rises significantly, from 7.1% in the first year to 52% among interns. This shift suggests that as students' progress, they become more comfortable with digital learning tools and recognize their benefits in education. The statistical significance (p=0.001p = 0.001p=0.001) confirms this changing trend. A growing number of students would recommend digital media as a learning tool for oral health (Q4.5). The percentage of students likely to recommend digital media rises from 57.6% in the first year to 74.5% among interns. This trend indicates increasing confidence in the effectiveness of digital media for education, with a statistically significant difference (p=0.005p = 0.005p=0.005).

Students' comfort with incorporating digital media into their regular study routines (Q4.6) increases as they advance in their education. In the first year, 60% of students report feeling comfortable using digital tools, and this percentage grows to 66.7% among interns. The number of students who are neutral about this integration drops significantly, suggesting that as they progress, they either fully embrace or reject digital learning methods. The statistical significance (p=0.001p = 0.001p=0.001) indicates a **strong correlation between academic advancement and digital media comfort**.

Most students recognize digital media's importance in their future careers (Q4.7). In the first year, 67.1% of students consider digital media important for their professional development, and this remains consistently high among interns (65.7%). However, the percentage of students who find digital media "very important" increases from 25.9% in the first year to 34.3% among interns. This growing recognition suggests that digital tools are becoming essential for continuous learning and professional growth in the field of dentistry (p=0.015p =

0.015p=0.015). Many students report encountering misleading or inaccurate information about oral diseases through digital platforms (Q4.8). While 45.9% of first-year students say they "sometimes" encounter misinformation, the percentage remains relatively high (41.2%) even among interns. The "often" category also stays consistent, with around 28% of students across different years experiencing frequent exposure to misleading information. This finding underscores the **need for increased awareness and critical evaluation of online sources** (p=0.001p = 0.001p=0.001). There is **strong support for integrating more digital tools into dental education** (Q4.9). The percentage of students who support this initiative increases from 61.2% in the first year to 66.7% among interns. Additionally, the number of students who "strongly support" the initiative rises significantly from 17.6% to 32.4% as students' progress through their studies. This increasing acceptance reflects a broader trend toward digital learning in modern education (p=0.001p = 0.001p=0.001).

Table – 4: Association of different Year of Study with Section 4 of the questionnaire

Questions	Responses	Year of Study										χ^2 value	P value
		1st year BDS		2nd year BDS		3rd year BDS		4th year BDS		Intern			
		N	%	N	%	N	%	N	%	N	%		
4.1) Do you believe digital media can play a significant role in improving public awareness of oral diseases?	Agree	50	58.80%	42	60.90%	47	78.30%	46	66.70%	78	76.50%	37.655	**0.002***
	Disagree	0	0.00%	0	0.00%	2	3.30%	2	2.90%	1	1.00%		
	Neutral	10	11.80%	4	5.80%	0	0.00%	1	1.40%	1	1.00%		
	Strongly agree	25	29.40%	23	33.30%	10	16.70%	20	29.00%	22	21.60%		
	Strongly disagree	0	0.00%	0	0.00%	1	1.70%	0	0.00%	0	0.00%		
4.2 Advantages	Visual aids and videos	43	50.60%	54	78.30%	41	68.30%	49	71.00%	84	82.40%	112.639	**0.001***
	Easy access to information	62	72.90%	60	87.00%	46	76.70%	62	89.90%	101	99.00%		
	Up-to-date content	40	47.10%	43	62.30%	39	65.00%	53	76.80%	90	88.20%		
	Interactive learning	25	29.40%	11	15.90%	9	15.00%	4	5.80%	21	20.60%		
4.3 Disadvantages	Lack of credible sources	33	38.80%	22	31.90%	21	35.00%	12	17.40%	28	27.50%	184.028	**0.001***
	Misinformation	33	38.80%	14	20.30%	26	43.30%	7	10.10%	13	12.70%		
	Distraction from academic studies	43	50.60%	46	66.70%	29	48.30%	60	87.00%	98	96.10%		
	Information overload	29	34.10%	36	52.20%	24	40.00%	40	58.00%	89	87.30%		
4.4) Do you think that traditional learning methods (textbooks, lectures) are more effective than digital media for understanding oral diseases?	Agree	37	43.50%	19	27.50%	16	26.70%	30	43.50%	28	27.50%	69.628	**0.001***
	Disagree	6	7.10%	26	37.70%	16	26.70%	20	29.00%	53	52.00%		
	Neutral	19	22.40%	13	18.80%	18	30.00%	6	8.70%	3	2.90%		
	Strongly agree	21	24.70%	10	14.50%	9	15.00%	13	18.80%	14	13.70%		
	Strongly disagree	2	2.40%	1	1.40%	1	1.70%	0	0.00%	4	3.90%		
4.5) How likely are you to recommend digital media as a learning tool for oral health to your peers?	Likely	49	57.60%	35	50.70%	39	65.00%	48	69.60%	76	74.50%	34.367	**0.005***
	Neutral	18	21.20%	16	23.20%	9	15.00%	4	5.80%	2	2.00%		
	Unlikely	4	4.70%	1	1.40%	2	3.30%	2	2.90%	4	3.90%		
	Very likely	13	15.30%	17	24.60%	10	16.70%	15	21.70%	20	19.60%		

											χ2 value	p-value
	Very unlikely	1	1.20%	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
4.6) How comfortable are you with integrating digital media into your regular study routine?	Comfortable	51	60.00%	38	55.10%	39	65.00%	51	73.90%	68	66.70%	36.568	**0.001***
	Neutral	21	24.70%	11	15.90%	13	21.70%	5	7.20%	3	2.90%		
	Uncomfortable	1	1.20%	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
	Very comfortable	12	14.10%	20	29.00%	8	13.30%	13	18.80%	31	30.40%		
4.7) How do you perceive the role of digital media in your future professional development?	Important	57	67.10%	47	68.10%	49	81.70%	55	79.70%	67	65.70%	24.899	**0.015***
	Unimportant	5	5.90%	1	1.40%	0	0.00%	0	0.00%	0	0.00%		
	Very important	22	25.90%	21	30.40%	11	18.30%	14	20.30%	35	34.30%		
	Very unimportant	1	1.20%	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
4.8) How often do you encounter misleading or inaccurate information about oral diseases on digital media?	Always	6	7.10%	0	0.00%	4	6.70%	3	4.30%	2	2.00%	40.547	**0.001***
	Never	1	1.20%	1	1.40%	0	0.00%	0	0.00%	2	2.00%		
	Often	31	36.50%	12	17.40%	17	28.30%	22	31.90%	29	28.40%		
	Rarely	8	9.40%	21	30.40%	5	8.30%	24	34.80%	27	26.50%		
	Sometimes	39	45.90%	35	50.70%	34	56.70%	20	29.00%	42	41.20%		
4.9) Would you support initiatives to incorporate more digital media tools in dental education?	Neutral	17	20.00%	7	10.10%	5	8.30%	3	4.30%	0	0.00%	33.648	**0.001***
	Oppose	1	1.20%	0	0.00%	0	0.00%	0	0.00%	1	1.00%		
	Strongly support	15	17.60%	21	30.40%	12	20.00%	15	21.70%	33	32.40%		
	Support	52	61.20%	41	59.40%	43	71.70%	51	73.90%	68	66.70%		

*Statistical significance set at 0.05; N: Number of samples; χ2 value: Chi-square value

IV. Discussion

This study explored the impact of digital media on the awareness of oral diseases among dental students in Bengaluru, India. The findings highlight the significant role digital platforms play in shaping dental students' knowledge, perceptions, and attitudes towards oral health.

The results indicate a high prevalence of digital media use among dental students for obtaining oral health information. A notable proportion of students across all academic years reported daily use of digital media, with second-year BDS students showing the highest percentage (66.7%). This underscores the integration of digital resources into their daily learning activities. This high daily usage aligns with broader trends of digital media integration in education, as noted by Haleem et al, 2022 [4]. YouTube emerged as the preferred platform across all study years, particularly among interns (94.1%) and fourth-year students (92.8%). The preference for YouTube highlights the importance of video-based content in dental education, aligning with the increasing popularity of visual learning aids in digital education. This is consistent with studies that emphasize the role of video-based learning in enhancing educational outcomes Brame et al 2016 [5] and Zhang et al 2006 [6].

The study also revealed that digital media significantly improves students' awareness of oral diseases. Second-year BDS students (98.6%) and fourth-year students (97.1%) reported the highest improvement in awareness due to digital media. This indicates that digital resources are particularly effective during the mid-academic years. However, there are variations in the perceived impact of digital media across different academic levels. Interns, for instance, reported a relatively lower enhancement in awareness (81.4%) compared to other years. This could be attributed to interns relying more on clinical experience and practical knowledge gained during their training. This observation contrasts somewhat with findings by Plack et al [7] who found a greater reliance on digital resources among postgraduate trainees.

Different digital platforms serve various purposes in dental education. Social media platforms are popular, especially among interns (50%) and second-year students (46.4%), reflecting the use of informal channels for information sharing and learning. In contrast, AI tools like ChatGPT are increasingly utilized by third-year (18.3%) and fourth-year students (11.6%), indicating a growing trend toward AI-driven learning in advanced academic years. This aligns with the broader integration of artificial intelligence in various fields, including healthcare and education. According to Masters K et al 2019 [8], AI tools are increasingly being adopted

in medical education for information retrieval and learning. However, in our study, YouTube still shows more frequent uses than AI tools.

Despite the benefits, the study also highlights concerns regarding the reliability of digital information. While most students find online information reliable, a notable proportion, particularly in the earlier years, express neutrality or scepticism. First-year students, for example, show a higher percentage of neutral responses (27.1%) compared to interns (2%). This suggests that as students' progress, they develop better skills in evaluating the credibility of online sources. This developmental trend is supported by Gross M.R. et al (2012) [9] which emphasizes the importance of developing critical appraisal skills throughout higher education. Misinformation and the lack of credible sources are significant disadvantages of digital media, especially for first-year students (38.8%). This underscores the need for dental education to include digital literacy training to help students effectively navigate and critically assess online information, a point that is also emphasized by Buchan et al 2024 [10].

Moreover, the study reveals a growing recognition of digital media's importance in students' future careers. A substantial percentage of students across all years acknowledge the role of digital media in their professional development, with interns showing a high level of agreement (65.7%). This highlights the increasing reliance on digital tools for continuous learning and professional growth in dentistry, mirroring the findings of Nasseripour, M. et al 2025 [11].

The findings of this study have several implications for dental education and practice. Dental institutions should integrate digital media into the curriculum to enhance students' learning experience and improve awareness of oral diseases. Educators should also emphasize the importance of verifying digital information and developing critical evaluation skills among students. Addressing the challenges associated with misinformation and information overload is crucial to maximizing the benefits of digital media in dental education. This is consistent with calls for integrating digital literacy and critical appraisal skills into curricula for Indian dental students (Saxena et al, 2018) [12].

V. Conclusion

In conclusion, the findings of this study indicate that digital media constitute a very significant source of information exposure for oral diseases among the young dental students of Bengaluru. Although these facilitative resources are widely applied for education, they present deterrents such as misinformation. Moreover, the study results suggest a gradually increasing acceptance of the use of digital media in dental education and further careers, necessitating that dental curricula be designed to incorporate such resources and critically evaluate them.

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