International Journal of Drug Research and Dental Science
Volume 7 Issue 3 (Page: 7-13), 2025 ISSN: 2582-0826

Assessment of Knowledge Attitude and Perception of Information and Communication Technology and Computed Assisted Learning Undergraduate Dental Students

Dr. V. Prasanna[1*], Dr. K. V. N. R. Pratap[2], Dr. T. Madhavi Padma[3], Dr. Srujan Kumar[4], Dr. Surbhit Singh[5], Dr. Ch. Nivasmurthy[6]

[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, India.
[3]Professor, Department of public health dentistry, Mamata Dental College, khammam, India.
[4]Reader, Department of public health dentistry, Mamata Dental College, khammam, India.
[5]Senior Lecturer, Department of public health dentistry, Mamata Dental College, khammam, India.
[6]Student, Department of public health dentistry, Mamata Dental College, khammam, India.

Original Article

[*]**Corresponding Author**: V. Prasanna**,** Department of Public Health Dentistry, Mamata Dental College, Khammam, India.
E-mail: Prasannavelishala@gmail.com
Crossref doi: https://doi.org/10.36437/ijdrd.2025.7.3.B

ABSTRACT

Background: The integration of Information and Communication Technology (ICT) and Computer-Assisted Learning (CAL) has transformed modern dental education, offering innovative methods for teaching, learning, and clinical training. Understanding students' knowledge, attitudes, and perceptions toward these tools is vital for effective implementation.

Objective: This study aims to assess the knowledge, attitude, and perception of undergraduate dental students regarding ICT and CAL in their academic and clinical training.

Methods: A cross-sectional survey was conducted among undergraduate dental students using a structured questionnaire. The instrument measured three key domains: knowledge of ICT and CAL tools, attitude towards their use in dental education, and perception of their effectiveness and usability.

Results: The majority of students demonstrated moderate to high knowledge of ICT applications, with a positive attitude toward the use of CAL in enhancing learning outcomes. Most participants perceived ICT and CAL as essential tools for modern dental education but highlighted the need for formal training and better infrastructure.

Conclusion: Undergraduate dental students show favorable knowledge and attitudes toward ICT and CAL. However, gaps in training and access must be addressed to fully leverage these technologies in dental education. Integrating ICT and CAL into the curriculum, supported by institutional resources, can enhance learning efficiency and prepare students for digitalized dental practice.

Keywords: Computer-Assisted Learning (CAL), Dental Education, Educational Technology, E-learning, Information and Communication Technology (ICT), Undergraduate Dental Students.

Introduction

The rapid advancement of Information and Communication Technology (ICT) has revolutionized the field of education, particularly in the health sciences. In dental education, the integration of ICT and Computer-Assisted Learning (CAL) has emerged as a valuable supplement to traditional teaching methods, offering interactive, flexible, and student-centered learning experiences. These technologies enable the simulation of clinical procedures, access to digital resources, and remote learning, making them essential in today's digitally-driven academic environment.

Despite the growing availability of ICT and CAL tools, their effective use in dental education depends largely on students' knowledge, attitudes, and perceptions. Positive engagement with these tools requires not only technical skills but also an appreciation of their potential benefits in academic and clinical settings. Understanding how undergraduate dental students perceive and utilize ICT and CAL can help educators and institutions identify gaps, address challenges, and implement strategies for more effective integration of digital tools into the curriculum.

This study aims to assess the level of knowledge, attitude, and perception of ICT and CAL among undergraduate dental students. By evaluating their preparedness and openness toward digital learning, the research provides insights into how modern educational technologies can be optimized to enhance dental training and professional competence.

Methodology

Aim: to assess the knowledge, attitude, and perception of undergraduate dental students regarding the use of Information and Communication Technology (ICT) and Computer-Assisted Learning (CAL) in their academic and clinical education.

Objectives

1. To evaluate the level of knowledge among Dental students regarding 'ICT' and 'CAL' Based on Year of study
2. To evaluate the level of knowledge among Dental students regarding' ICT' and 'CAL' based on gender.

Study design and area: A cross sectional study was carried out at Mamata Dental College, Khammam, Telangana.

Study population: The health care students included a total of 236 dental students of all years.

Study instrument: A protested offline questionnaire was given consisting of 13 questions each participant had to fill in their demographic data like name, gender, age and year of study. Participants had to select one option from the answers provided against each question.

Sampling Methodology: The Sampling methodology used is convenience Sampling.

Inclusion Criteria: Students who were present on the day of study and were willing to participate are included.

Exclusion criteria: Students who were absent on the day of the study and who did not give their Consent were excluded.

Organizing the study: The study was designed in a paper based version of the self-administered questionnaire of 13 questions focusing on knowledge and awareness includes the sections of demographic data.

Result

A Total of 236 students in this study with females 42.8% males 57.2% age of participants ranging from 18 to 27 years in this study, males were more likely to demonstrate perception. Significantly 2nd BDS showed greater familiarity with advanced applications than 1st, 3rd and 4th year and intern students.

	N	Minimum	Maximum	Mean	Std. Deviation
Age:	236	18	27	21.87	1.893

Gender		Frequency	Percent
Valid	MALE	135	57.2
	FEMALE	101	42.8
	Total	236	100.0

Year of Study		Frequency	Percent
Valid	I BDS	51	21.6
	II BDS	67	28.4
	III BDS	45	19.1
	IV BDS	48	20.3
	INTERN	25	10.6
	Total	236	100.0

Distribution and comparison of responses based on gender

Item	Response	Males		Females		Chi-Square value	P value
		n	%	n	%		
Q1	1	4	57.1	3	42.9	7.326	0.62
	2	103	54.2	87	45.7		
	3	18	75	6	25		
	4	10	66.6	5	33.3		
Q2	1	19	43.2	25	56.8	10.378	**0.016***
	2	50	54.9	41	45.1		
	3	44	59.5	30	40.5		
	4	22	81.5	5	18.5		
Q3	1	19	47.5	21	52.5	6.481	0.090
	2	33	48.5	35	51.5		
	3	53	63.9	30	36.1		
	4	29	65.9	15	34.1		
Q4	1	16	42.1	22	57.9	19.818	**0.0001***
	2	15	40.5	22	59.5		
	3	34	50.7	33	49.3		
	4	69	74.2	24	25.8		
Q5	1	16	45.7	19	54.3		
	2	29	46	34	54	10.620	**0.014***
	3	66	62.9	39	37.1		
	4	24	75	8	25		
Q6	1	29	53.7	25	46.3	5.049	0.168
	2	30	47.6	33	52.4		
	3	55	62.5	33	37.5		
	4	21	67.7	10	32.3		

Q7	1	28	57.1	21	42.9	9.489	**0.023***
	2	45	54.9	37	45.1		
	3	37	50	37	50		
	4	24	82.8	5	17.2		
Q8	1	25	50	25	50	10.167	**0.017***
	2	35	60.3	23	39.7		
	3	37	48.1	40	51.9		
	4	38	74.5	13	25.5		
Q9	1	34	53.1	30	46.9	1.211	0.750
	2	40	60.6	26	39.4		
	3	41	55.4	33	44.6		
	4	20	62.5	12	37.5		
Q10	1	24	52.2	22	47.8	8.275	**0.041***
	2	29	60.4	19	39.6		
	3	35	46.7	40	53.3		
	4	46	69.7	20	30.3		
Q11	1	36	57.1	27	42.9	5.928	0.115
	2	29	59.2	20	40.8		
	3	36	48.6	38	51.4		
	4	34	70.8	14	29.2		
Q12	1	20	43.5	26	56.5	6.303	0.98
	2	32	59.3	22	40.7		
	3	61	64.9	33	35.1		
	4	22	52.4	20	47.6		
Q13	1	31	49.2	32	50.8	2.483	0.478
	2	30	62.5	18	37.5		
	3	54	60	36	40		
	4	20	57.1	15	42.9		

P≤0.05 is statistically significant

Distribution and comparison of responses based on year of the study

Item	Response	I BDS		II BDS		III BDS		IV BDS		INTERN		Chi-Value	P-Value
		n	%	n	%	n	%	n	%	n	%		
Q1	1	2	28.5	1	14.2	2	28.5	1	14.2	1	14.2	16.114	0.186
	2	37	20.9	53	29.9	35	19.7	36	20.3	16	9.0		
	3	9	24.3	10	27	5	13.5	7	18.9	6	16.2		
	4	3	20	3	20	3	20	4	26.6	2	13.3		
Q2	1	12	27.3	9	20.5	7	15.9	10	22.7	6	13.6	7.842	0797
	2	19	20.9	30	33	16	17.6	16	17.6	10	11		
	3	15	20.3	18	24.3	16	21.6	19	25.7	6	8.1		
	4	5	18.5	10	37	6	22.2	3	11.1	3	11.1		
Q3	1	12	30	10	25	6	15	6	15	6	15	11.192	0.513
	2	7	25	18	26.5	14	20.6	16	23.5	3	4.4		
	3	14	16.9	28	33.7	18	21.7	14	16.9	9	10.8		

	4	8	18.2	11	25	7	15.9	11	25	7	15.9		
Q4	1	11	28.9	11	28.9	6	15.8	6	15.8	4	10.5	17.051	0149
	2	11	29.7	8	21.6	6	16.2	11	29.7	1	2.7		
	3	14	20.9	22	32.8	15	22.4	13	19.4	3	4.5		
	4	15	16.1	25	26.9	18	19.4	18	19.4	17	18.3		
Q5	1	12	34.3	8	22.9	5	14.3	5	14.3	5	14.3	18.317	0.106
	2	11	17.5	17	27	15	23.8	17	27	3	4.8		
	3	19	18.1	37	35.2	16	15.2	22	21	11	10.5		
	4	9	28.1	5	15.6	8	25	4	12.5	6	18.8		
Q6	1	17	31.5	12	22.2	9	16.7	8	14.8	8	14.8	42.592	**0.0001***
	2	14	22.2	17	27	15	23.8	16	25.4	1	1.6		
	3	19	21.6	33	37.5	7	8	20	22.7	9	10.2		
	4	1	3.2	5	16.1	14	45.2	4	12.9	7	22.6		
Q7	1	11	22.4	15	30.6	3	6.1	9	18.4	11	22.4	19.802	0.071
	2	19	23.2	22	26.8	16	19.5	18	22	7	8.5		
	3	18	24.3	19	25.7	20	27	14	18.9	3	4.1		
	4	3	10.3	10	34.5	6	20.7	6	20.7	4	13.8		
Q8	1	12	24	14	28	6	12	9	18	9	18	15.579	0.211
	2	10	17.2	15	25.9	11	19	13	22.4	9	15.5		
	3	21	27.3	25	32.5	13	16.9	15	19.5	3	3.9		
	4	8	15.7	13	25.5	15	29.4	11	21.6	4	7.8		
Q9	1	17	26.6	20	31.2	8	12.5	6	9.4	13	20.3	22.714	**0.030***
	2	13	19.7	21	31.8	11	16.7	15	22.7	6	9.1		
	3	17	23	18	24.3	15	20.3	20	27	4	5.4		
	4	4	12.5	8	25	11	34.4	7	21.9	2	6.2		
Q10	1	13	28.3	13	28.3	5	10.9	5	10.9	10	21.7	19.322	0.081
	2	11	22.9	12	25	10	20.8	12	25	3	6.2		
	3	14	18.7	25	33.3	17	22.7	17	22.7	2	2.7		
	4	13	19.7	17	25.8	13	19.7	13	19.7	10	15.2		
Q11	1	18	28.6	11	17.5	8	12.7	11	17.5	15	23.8	25.349	**0.013***
	2	11	22.4	16	32.7	8	16.3	11	22.4	3	6.1		
	3	13	17.6	24	32.4	17	23	18	24.3	2	2.7		
	4	9	18.8	14	29.2	12	25	8	16.7	5	10.4		
Q12	1	12	26.1	13	28.3	6	13	5	10.9	10	21.7	29.118	**0.04***
	2	11	20.4	22	40.7	10	8.5	7	13	4	7.4		
	3	18	19.1	23	24.5	17	18.1	31	33	5	5.3		
	4	10	23.8	9	21.4	12	28.6	5	11.9	6	14.3		
Q13	1	17	27	16	25.4	6	9.5	13	20.6	11	17.5	14.206	0.288
	2	9	18.8	17	35.4	10	20.8	8	16.7	4	8.3		
	3	20	22.2	23	25.6	18	20	21	23.3	8	8.9		
	4	5	14.3	11	31.4	11	31.4	6	17.1	2	5.7		

P≤0.05 is statistically significant

Discussion

The findings of this study reveal that the majority of undergraduate dental students possess a moderate to high level of knowledge regarding ICT and CAL tools. Most students displayed a positive attitude toward incorporating these technologies

into their learning environment. This aligns with global trends, where digital literacy is increasingly considered an essential skill in healthcare education.

Students recognized the benefits of ICT and CAL, such as improved access to educational content, flexibility in learning, and enhanced understanding of complex dental procedures through simulations and visual aids. However, a notable portion of participants reported challenges such as limited infrastructure, lack of formal training, and inconsistent integration of digital tools into the curriculum. These barriers can hinder the effective use of ICT and CAL, despite students' willingness to engage with them.

The results also suggest that while students are open to technology-enhanced learning, there is a strong demand for institutional support in terms of workshops, training sessions, and updated technological infrastructure. Educators must also adapt teaching strategies to ensure the effective use of digital tools for clinical and theoretical training.

Conclusion

This study concludes that undergraduate dental students generally hold positive knowledge, attitudes, and perceptions regarding ICT and Computer-Assisted Learning. Their willingness to adopt digital tools presents a significant opportunity to enhance the quality and accessibility of dental education. However, to maximize the benefits of ICT and CAL, institutions must address existing challenges by improving infrastructure, offering formal training programs, and integrating digital learning into the core curriculum. Doing so will help prepare students for modern, tech-driven dental practice and improve overall educational outcomes.

References

1. Kumar A, Aswal A, Singh L. 4G wireless technology: a brief review. Int J Eng Manag Res 2013;3:35–43.
2. Consalvo M, Ess C. The Handbook of Internet Studies. Blackwell Publishing Ltd; 2011. https://onlinelibrary.wiley.com/doi/book/10.1002/9781444314861
3. Zagidullina MV. Teenagers: reading and the internet in everyday life. Sotsiologicheskie issledovaniya [Sociological Studies] 2016;5:115–123.
4. Khatoon B, Hill KB, Walmsley AD. Can we learn, teach and practise dentistry anywhere, anytime? Br Dent J 2013;215(7):345–347. doi: https://doi.org/10.1038/sj.bdj.2013.957
5. Lin CY, Peng KL, Chen J, et al. Improvements in dental care using a new mobile app with cloud services. J Formos Med Assoc 2014;113(10):742–749. doi: https://doi.org/10.1016/j.jfma.2014.02.009
6. Knösel M, Jung K, Bleckmann A. YouTube, dentistry, and dental education. J Dent Educ 2011;75(12):1558–1568. https://pubmed.ncbi.nlm.nih.gov/22184594/
7. Mattheos N, Stefanovic N, Apse P, et al. Potential of information technology in dental education. Eur J Dent Educ 2008;12(Suppl 1):85–92. doi: https://doi.org/10.1111/j.1600-0579.2007.00483.x
8. Mohamed AM, Aik TC, Yi LP, et al. Dental students' attitudes and perceptions towards ICT resources and skills. Procedia Soc Behav Sci 2010;18:400–403. doi: https://doi.org/10.1016/j.sbspro.2011.05.058

How to cite this Article: V. Prasanna, K. V. N. R. Pratap, T. Madhavi Padma, Srujan Kumar, Surbhit Singh, Ch. Nivasmurthy; *Assessment of Knowledge Attitude and Perception of Information and Communication Technology and Computed Assisted Learning Undergraduate Dental Students;* Int. J. Drug Res. Dental Sci., 2025; 7(3): 7-13, **doi:** https://doi.org/10.36437/ijdrd.2025.7.3.B
Source of Support: Nil, **Conflict of Interest:** Nil.
Received: 24-3-2025 **Revised:** 22-5-2025 **Accepted:** 30-5-2025