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Bridging the Chairside and Classroom: Enhancing Undergraduate Clinics with Real-time Learning on Dental and Systemic Health

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Original Article

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ABSTRACT

Background: Bridging the gap between chairside experiences and classroom learning ensures that students are exposed to real-world challenges, enhancing their clinical competence and understanding of patient-centered care. Incorporating technology, interdisciplinary teaching, and reflective learning further enriches this model, aligning dental education with the evolving demands of healthcare delivery. This background underscores the need for innovative educational strategies that prepare students to address the intricate interplay between dental and systemic health effectively.

Aim: To enhance Undergraduate dental education by incorporating chairside learning in clinical settings focusing on the intersection of dental care and broader systemic health issues by enabling students to gain real-time practical experience with both general and dental practice.

Objective

1. To provide students with hands-on experience in diagnosing, treating, and managing a range of dental conditions, while understanding their potential systemic health implications.
2. To enable students to apply theoretical knowledge in real-world settings, helping them understand the interrelation between oral health and systemic diseases.

Method: A cross-sectional survey was conducted among 200 dental students comprising 55 males and 145 females. The survey included 14 questions. Responses were analyzed based on gender and year of study using chi-square to identify statistically significant differences.

Keywords: Chairside, Clinics, Dental, Health, Learning.

Introduction

The integration of classroom learning with real-time clinical experience is a transformative approach in dental education. Dentistry is not limited to treating oral conditions in isolation; instead, it requires a deep understanding of the

intricate relationship between oral and systemic health. For undergraduate students, bridging the gap between theoretical knowledge and practical application is essential to develop critical thinking, diagnostic skills, and comprehensive patient care strategies.

Real-time learning at the chairside allows students to apply classroom concepts to live clinical scenarios, enhancing their understanding of how systemic conditions, such as diabetes, cardiovascular diseases, and autoimmune disorders, influence oral health. Simultaneously, incorporating case-based discussions and interdisciplinary teaching methods in classrooms enriches students' grasp of the broader health implications of their clinical decisions.

By fostering this integration, dental educators can prepare students to address complex health needs, emphasizing the dentist's role in promoting overall health and well-being. This approach not only enhances learning but also ensures better patient outcomes by creating a new generation of dentists equipped to provide holistic care.

Methodology

A) Study design and area: A cross-sectional study was carried out at the tertiary care teaching hospital khammam.

B) Study population: The health care students including those of IV year and Interns who responded to the offline paper print questionnaire survey.

C) Study Instrument: A self-administered questionnaire was designed based on knowledge attitude and awareness of the advanced technology had total 14 questions. Each participant has to fill in their demographic data like Name, age, and year of study. Participants had to select one option from the answers provided against questions the questions were based on knowledge attitude and awareness among dental students.

D) Pilot study: A pilot study was conducted on a group of students to assess the validity and reliability of the study.

E) Sampling Method: The sampling method used is a convenience method.

F) Inclusion Criteria: The students who were interested in the study and who were willing to participate.

G) Exclusion criteria: Students who are not willing to participate are excluded.

H) Organizing the study: The study was designed in a paper-based version of the self-administered questionnaire of 14 questions focusing on knowledge, and awareness.

Includes the sections of demographic data: Name, Age, Sex, and Year of study demographic information and asked to answer all questions by selecting one option from the provided answers.

I) Statistical analysis: Data from the filled questionnaire was collected in a tabular form in an Excel worksheet and evaluated for analysis. The analysis was performed by SSPS version 29.

Results

A total of 200 students took part in this, both female and male. The ages of participants ranged from 19 to 26 years. In this study, females have more knowledge regarding chair-side learning than males. Interns have more knowledge, followed by IV-year students, followed by III-year students.

AGE					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	200	19	26	23.84	2.323

Gender		Frequency	Percent
Valid	Male	55	
	Female	145	78.0
	Total	200	100.0

Year of the study		Frequency	Percent
Valid	III BDS	62	31.0
	IV BDS	64	32.0
	INTERN	74	37.0
	Total	200	100.0

Distribution and comparison of responses based on gender

Item	Response	Males		Females		Chi-Square value	P value
		n	%	n	%		
Q1	1	6	10.9	27	18.6	6.363	0.04*
	2	38	69.0	61	42.0		
	3	5	9.0	43	29.6		
	4	6	10.9	14	9.6		
Q2	1	9	16.3	25	17.2	8.646	**0.016***
	2	30	54.5	53	36.5		
	3	11	20.0	41	28.2		
	4	5	9.0	26	17.9		
Q3	1	14	16.7	15	10.4	6.481	0.090
	2	5	5.4	20	12.1		
	3	3	4.1	15	22.6		
	4	33	75.1	95	56.8		
Q4	1	16	42.1	23	17.9	9.817	**0.06**

	2	15	40.5	25	19.5		
	3	9	15.4	70	51.3		
	4	15	4.2	34	25.1		
Q5	1	16	25.7	10	14.3	6.655	0.07
	2	21	34.3	54	25.7		
	3	10	26.5	64	35.7		
	4	8	13.3	17	18.6		
Q6	1	15	23.7	25	46.3	5.046	0.167
	2	18	47.6	33	52.4		
	3	10	22.5	85	67.5		
	4	12	7.7	11	32.3		
Q7	1	18	57.1	21	42.9	9.485	**0.06**
	2	15	14.9	37	45.1		
	3	10	22.5	76	54.1		
	4	12	10.4	10	32.5		
Q8	1	25	45.4	95	65.5	6.166	**0.015***
	2	19	34.5	23	15.8		
	3	6	10.9	17	11.7		
	4	4	7.2	10	6.8		
Q9	1	12	29.1	30	46.9	1.211	0.750
	2	15	30.6	26	39.4		
	3	10	25.4	73	54.6		
	4	7	12.5	12	37.5		
Q10	1	24	52.2	22	15.8	8.275	**0.041***
	2	9	30.4	19	19.6		
	3	7	20	20	23		

	4	4	10.4	94	43.5		
Q11	1	36	57.1	15	19.3	5.928	0.115
	2	8	13.2	99	61.3		
	3	6	12.6	14	12.5		
	4	5	11.7	17	14.6		
Q12	1	20	13.5	26	16.5	6.303	0.98
	2	32	19.3	22	20.7		
	3	61	64.9	33	25.1		
	4	35	16.6	90	47.5		
Q13	1	10	29.2	54	30.8	2.483	0.478
	2	20	42.5	18	17.5		
	3	14	19.1	73	33.5		
	4	11	10.5	10	22.5		
Q14	1	21	38.1	24	16.5	3.258	0.003*
	2	6	10.9	24	16.5		
	3	10	18.1	52	35.8		
	4	18	32.7	45	31.0		

P≤0.05 is statistically significant

Distribution and comparison of responses based on year of the study

Item	Response	III BDS		IV BDS		INTERN		Chi-Value	P-Value
		n	%	n	%	n	%		
Q1	1	17	27.4	14	21.8	13	17.5	14.645	0.004*
	2	29	46.7	30	46.8	36	48.6		
	3	3	4.8	15	23.4	17	22.9		
	4	13	20.9	5	7.8	8	10.8		
Q2	1	7	9.7	10	16.6	14	20.5	7.842	0.005”
	2	36	50	36	60	32	47.0		

	3	20	27.7	12	20	14	20.5		
	4	9	12.5	2	3.3	8	11.7		
Q3	1	6	15	6	15	6	15	11.192	0.513
	2	14	20.6	16	23.5	3	4.4		
	3	18	21.7	14	16.9	9	10.8		
	4	7	15.9	11	25	7	15.9		
Q4	1	6	15.8	6	15.8	4	10.5	17.051	0149
	2	6	16.2	11	29.7	1	2.7		
	3	26	23.4	33	34.5	34	43.5		
	4	42	36.5	8	12.6	25	34.6		
Q5	1	5	8.0	5	7.8	25	33.7	13.314	0.04*
	2	15	24.1	17	26.5	33	44.5		
	3	25	40.3	18	28.1	10	13.5		
	4	17	27.4	24	37.5	6	8.1		
Q6	1	9	16.7	8	14.8	8	14.8	42.592	**0.07**
	2	15	23.8	16	25.4	1	1.6		
	3	7	8	20	22.7	9	10.2		
	4	14	45.2	4	12.9	7	22.6		
Q7	1	3	6.1	9	18.4	11	22.4	19.802	0.071
	2	16	19.5	18	22.5	7	8.5		
	3	46	54.7	25	32.6	20	21.5		
	4	12	32.2	17	23.6	30	51.9		
Q8	1	10	29.4	31	48.6	13	23.3	15.579	0.06
	2	22	30.6	21	36.4	25	36.9		
	3	20	28.6	10	25.6	12	24.5		
	4	10	29.4	2	6.5	24	32.6		

Q9	1	8	12.5	6	9.4	13	20.3	22.714	**0.07**
	2	11	16.7	15	22.7	6	9.1		
	3	15	20.3	20	27	4	5.4		
	4	11	34.4	7	21.9	2	6.2		
Q10	1	5	10.9	5	10.9	10	21.7	19.322	0.081
	2	10	20.8	12	25.5	3	6.2		
	3	30	50.6	13	26.7	17	54.6		
	4	27	19.1	30	39.5	38	18.5		
Q11	1	11	14.7	15	58.3	30	58.8	25.349	**0.07**
	2	15	15.3	25	41.7	28	41.2		
	3	24	43.5	21	24.5	10	21.5		
	4	13	23.6	13	32.5	6	9.6		
Q12	1	6	13	5	10.9	10	21.7	29.118	**0.04***
	2	10	8.5	7	13.6	4	17.4		
	3	17	18.1	31	53.5	5	15.3		
	4	39	73.8	22	24.5	59	67.6		
Q13	1	36	39.5	13	20.6	11	17.5	14.206	0.288
	2	10	20.8	8	16.7	4	8.3		
	3	22	32.6	39	53.6	54	74.6		
	4	3	34.6	23	34.5	23	33.5		
Q14	1	16	25.8	4	6.2	10	13.5	12.256	**0.04***
	2	7	11.2	21	32.8	11	14.8		
	3	17	27.4	25	39.0	30	40.5		
	4	22	35.4	24	37.5	23	31.0		

P≤0.05 is statistically significant

Discussion

The integration of chairside learning with classroom education is an innovative approach to enhancing undergraduate dental clinics. By bridging the gap between clinical practice and theoretical understanding, this model not only improves students' comprehension of oral-systemic health connections but also equips them with the critical thinking and diagnostic skills necessary for holistic patient care.

One of the key advantages of this approach is the opportunity for real-time learning. Chairside teaching allows students to directly apply classroom knowledge to clinical scenarios, reinforcing their understanding of conditions such as diabetes and cardiovascular diseases, and their impact on oral health. This hands-on experience fosters a deeper appreciation of the dentist's role in managing systemic health issues, particularly in patients with comorbidities.

The incorporation of reflective learning through post-clinic discussions and case presentations enhances critical thinking and encourages students to analyze complex cases in a structured manner. Moreover, interdisciplinary collaboration with medical professionals provides students with a broader perspective on patient management, emphasizing the importance of teamwork in healthcare.

Technology plays a pivotal role in this framework, with tools like chairside software, augmented reality, and virtual reality simulations offering innovative ways to bridge the classroom and clinical environment. These technologies not only make learning more engaging but also help students visualize complex oral-systemic interactions and practice clinical decision-making in a controlled environment.

However, the successful implementation of this model requires careful planning and resource allocation. Faculty must be trained to deliver effective chairside teaching, and the integration of interdisciplinary and technology-based tools demands financial and administrative support. Additionally, students may initially find it challenging to balance the dual demands of chairside and classroom learning. Structured schedules and regular feedback mechanisms can address these challenges.

Conclusion

Integrating chairside and classroom learning represents a significant advancement in dental education. By fostering a comprehensive understanding of oral and systemic health, this approach not only benefits students but also prepares them to provide better patient care in their future practice. Further research and refinement of this model can ensure its scalability and effectiveness in diverse educational settings.

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