



Perceptions and Practice of Online Health Education Programs among Postgraduate Students of Public Health Dentistry in India

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ABSTRACT

Introduction: Information technology has developed very rapidly in a short span and touched almost every aspect of social life thereby expanding and altering economic and social activities all over the world.¹ Information technology is being used in various aspects of health informatics from telemedicine to robot-assisted surgery. Tech-infused methods are integrated into the healthcare experience to enhance two key areas: accessibility and efficacy. It also has the potential to trim the burgeoning cost of the traditional healthcare scenario.²

Aims and Objectives: To evaluate the perception and practice of postgraduate dental students in facilitating online health education using a self-administered questionnaire.

Materials and Methods: This descriptive cross-sectional study was conducted using an 18-item self-administered online questionnaire among postgraduate students of public health dentistry across India. A total of 312 subjects responded. Only completed questionnaires were included in the study. The first part of the questionnaire included demographic details like name, gender, age, and college of the study subjects and the second part consisted of 18 closed-ended questions assessing the perception and practice of virtual health education among postgraduate students of Public Health Dentistry.

Results: Among the 312 study subjects who participated in the study, 62.5% were females and 37.5% were males. 95.2% of the study subjects were aware of the term dental informatics (p-value- 0.037). Among the study subjects, 26.2% strongly agreed and 64.4% agreed that informatics and technology is a useful



alternative tools that can be used to provide health education (p-value-0.028). In the present study, 37.8% of the respondents use Zoom Cloud Meetings. 4.5% use Microsoft team, 9.3% use Google Meet, 20.2% of them use both Zoom Cloud Meetings and Google meet, 4.2% use all three (Zoom Cloud Meetings, Microsoft team, and Google Meet), 1.9% and 2.6% of them used other apps like Cisco Webex respectively (p-value-0.012). Among the respondents, 50.3% of them have provided online health education using audio-visual aid as the mode of presentation (p-value – 0.023).

Conclusion: Online health education programs have enabled the continuation of health education during these unprecedented times. According to the perception of post-graduates, online health education is effective and feasible compared to the conventional method of health education. The evaluation results revealed the usability of this system. This is a conspectus demonstration of perceptions and practice of online health education programs carried out by dental students.

Keywords: Dental informatics, Informatics, Online Health Education, Public Health Dentistry, Postgraduate Students.

Introduction

The term informatics was propounded by Aleksei Mikhailov at the University of Moscow in 1960. He defined informatics as the discipline that “studies the structure and general properties of scientific information and the laws of all processes of scientific communication.”¹

Medical informatics is an amalgamation of information science, computer science, and health care by applying and combining health and biomedicine. Dental informatics grew up as a sub-discipline of medical informatics, with the aim to improve patient outcomes and efficient delivery of dental care. Even with such a big catbird seat dental informatics has not reached its potential.

Development of an effective public health information system requires understanding public health informatics, the systemic application of information, and computer sciences to public health practices. Biostatistics, community health education, and geospatial information system (GIS), including teledentistry are the main areas where dental informatics is applied.²

Traditionally health education was delivered in physical presence, but with the development in technology various avenues have opened up in disseminating healthcare via online medium. This could help in wider and effortless access for consumers in timely manner.

Despite these developments, dental faculty and administrators in general are not very familiar with dental informatics as an area of scientific inquiry. Many confuse informatics with information technology (IT) and are unaware of its scientific methods and principles, and cannot relate dental informatics to biomedical informatics as a whole. The potential role of dental informatics in diminishing oral health inequalities in underserved populations has been recognized by a number of reports from all over the world.³

Hence, the purpose of this study is to evaluate the understanding and perception of post graduate dental students in facilitating online health education. A deeper understanding of this will help the faculties and administrators understand how dental informatics can most effectively help their efforts and how its methods can be exploited to elevate the state of the art in education, research, and patient care.

Materials and Methods

A questionnaire-based study was conducted among the public health postgraduate students of various colleges in India to evaluate their perception and practice of postgraduate dental students in facilitating online health education. A pilot study was conducted among 25 participants to assess the feasibility and applicability of the questionnaire. The reliability statistics obtained for the questionnaire using Cronbach's alpha coefficient was 0.84 indicating good internal consistency. A list of Dental Colleges in India was obtained from the official website of the Dental Council of India. The study questionnaire was framed on Google forms and the link to the questionnaire was sent to all the postgraduate students of various colleges in India. Reminders were sent to the study subjects at regular intervals to fill out the questionnaire in the stipulated timeframe. The Questionnaire was accompanied by an introductory letter stating the purpose of the study and promising confidentiality of the subjects. A total of 312 subjects responded and only fully completed questionnaires were included in the study.

The first part of the questionnaire included demographic details like name, gender, age, and college of the study subjects and the second part consisted of 18 closed-ended questions assessing the perception and practice of virtual health education among postgraduate students of public health dentistry.

Results

The present cross-sectional study was conducted to evaluate the perception and practice of postgraduate dental students in facilitating online health education using a self-administered questionnaire.

Awareness about term dental informatics	Female		Male		Total		P-Value
	N	%	N	%	N	%	
Yes	184	62%	113	38%	297	95.2%	0.037
No	11	73.3%	4	26.7%	15	4.8%	
Total	195	62.5%	117	37.5%	312	100%	

Table 1: Awareness about the term dental informatics among study subjects.

Table 1 shows the awareness of the term dental informatics in the study population according to their gender. In the present study, 95.2% (297) of the study subjects were aware of the term dental informatics. Among them, 62% (184) were females and 38% (113) were males. 4.8% (15) of the study subjects were unaware of the term dental informatics. Among them, 73.3% (11) of them were females and 26.7% (4) were males. The results were statistically significant with a p-value of 0.037.

Informatics and technology is a useful alternative tool to provide health education	Females		Males		Total		P-value
	N	%	N	%	N	%	
Strongly disagree	14	58.3%	10	41.7%	24	7.6%	0.028
Disagree	3	60%	2	40%	5	1.6%	
Agree	131	65.1%	70	34.9%	201	64.4%	
Strongly agree	47	57.3%	35	42.7%	82	26.2%	
Total	195	62.5%	117	37.5%	312	100%	

Table 2: Informatics and technology as a useful alternative tool to provide health education.

Table 2 shows the gender distribution of study subjects according to their perception of the usefulness of Information and Technology in providing health education. In the present study, 26.2% strongly agreed and 64.4% agreed that informatics and technology is a useful alternative tools that can be used to provide health education. 7.6% of the study subjects strongly disagreed and 1.6% disagreed that informatics and technology is a useful alternative tools. Among the respondents who agree with this, 65.1% are females and 34.9% are males. Among those who strongly agree, 57.3% are females and 42.7% are males. Among those who strongly disagree, 58.3% are females, and 41.7% are males. Among those who disagree, 60% are females and 40% are males. The results were statistically significant with a p-value of 0.028.

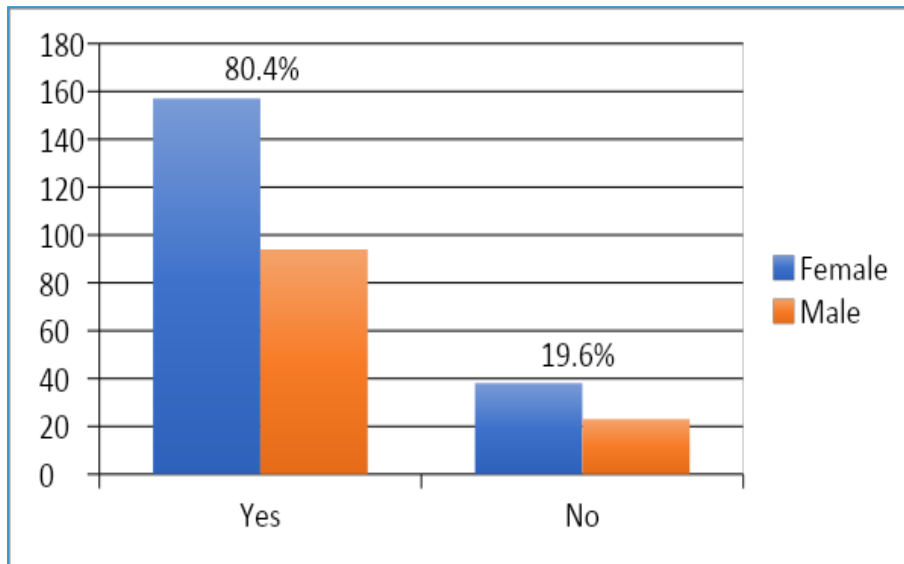


Figure 1: Distribution of study subjects providing online health education

Figure 1 shows the distribution of study subjects according to their practice of online health education. In the present study, 80.4% of the respondents provided online health education and 19.6% had not conducted online health education.

Difficulties Faced	Females		Males		Total		P-Value
	N	%	N	%	N	%	
Technical issues	173	62.5%	104	37.5%	277	88.78%	0.040
Lack of computer knowledge	6	50%	6	50%	12	3.84%	
Time management	15	68.2%	7	31.8%	22	7.05%	
Others	1	100%	0	0%	1	0.32%	
Total	195	62.5%	117	37.5%	312	100%	

Table 3: Difficulties faced while providing an online health education programme among study subjects

Table 3 shows the distribution of the study subjects according to the difficulties faced by them while providing an online health education programme. In the present study, among the respondents 88.78% reported facing technical issues while providing an online health education programme, 3.84% stated a lack of computer knowledge, 7.05% of the respondents had difficulty managing time and 0.32% of the respondents had other difficulties while providing online health education. The results were statistically significant with p-value of 0.040.

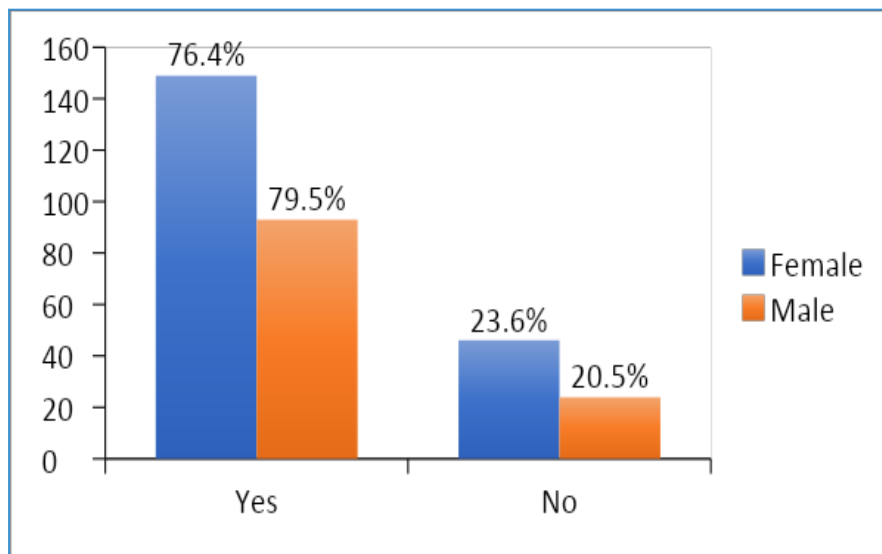


Figure 2: Perception related to economic feasibility of online health education programme.

Figure 2 shows the distribution of the study subjects according to their perception related to the economic feasibility. In the present study, 77.6% of the respondents were of the opinion that online health education is



economically feasible and 22.4% of the respondents thought online health education is not economically feasible.

Discussion

This research work presents an overview of the perception and practice of post graduate students towards conducting online health education programme. Multiple studies are available in the literature explaining the role and importance of dental informatics, but there is a dearth of data regarding perception and practice towards application of dental informatics among dentists or dental students. This study aims in reducing that gap in the literature.

A total of 312 postgraduate students participated in this study from different parts of the country. Among them, 62.5% were females and 37.5% were males.

According to the present study, the majority of the respondents i.e., 95.2% were aware of the term dental informatics (297) and 92.9% (290) respondents knew the definition of dental informatics.

Majority of the respondents (97.7%) provided health education as part of an oral health outreach programme always or occasionally and 90% of them agreed that informatics and technology is a useful alternative tool that can be used to provide health education.

According to the study conducted by Janneke et al⁴ to test the efficacy of a theory-based program using an online social media platform (Telegram) among three different intervention groups, an adolescent only intervention group, an adolescent and mother intervention group, and a control group, it was found that there was a significant improvement in toothbrushing behaviour and oral hygiene status of participants in all the intervention groups, with more significant improvement in adolescent and mother intervention group. In the present study, it was found that the majority of the respondents agreed that online health education is effective. They were also of the opinion that practical simulation exercise like tooth brushing is possible during an online health education.

In the present study, among the respondents 80.4% of them have provided online health education and among them, 49.7% of the respondents has conducted 1-5 online health education programs, 14.1% of the respondents has conducted 6-10 online health education programs and 15.4% of the respondents has conducted more than 10 online health education programs in their institution during the past 7 months. This shows that even during this time of pandemic, majority of the colleges continued with, providing oral health education programs through online platforms.

Among the respondents conducting online health education, 37.8% of the respondents used zoom, 4.5% used Microsoft team, 9.3% used google meet, 20.2% of them used both zoom and google meet, 4.2% used all three (zoom, Microsoft team, and google meet), 1.9% and 2.6% of them used other apps like cisco and Webex respectively.

According to the study conducted by Saloni et al⁵ to assess the knowledge gained through dental health education in a randomly assigned group before and after undergoing a dental procedure using three different aids (audio, visual and audio-visual), it was found that the audio-visual aids could help eliminate any language barrier and facilitate easier understanding of the procedure. The post-treatment values reported a significant difference in knowledge gained, which favours the use of audio-visual aids. In the present study, it was found



that among the respondents, 50.3% of them provided online health education using audio-visual aid as the mode of presentation.

In the present study, among the respondents 88.78% of them faced technical issues while providing an online health education programme. The difficulties faced by 3.84% of the respondents while providing an online health education programme was lack of computer knowledge and 7.05% of the respondents had difficulty with time management.

According to the study conducted by Lang P W et al⁶ to access the knowledge, opinions, and experience regarding dental informatics and computers among first-year dental students and fourth-year dental students, it was found that informatics knowledge and experience increased during dental school, and knowledge disparities between genders disappeared. A difference in computer knowledge between the entering first-year dental male and female students was observed, which was in synchrony with the present study where it was found that the majority of the females faced difficulties like technical issues while providing online health education.

Among the study population, 77.6% of the respondents thought that online health education is economically feasible and 84.9% had the opinion that audience won't stay more focussed during online health education than the conventional method which is in contrast to the study conducted by Zulkarnain et al. According to the study conducted by Zulkarnain et al⁷ to evaluate the effectiveness of multimedia (cartoon animation) as a medium to increase knowledge, attitude and practice towards the importance of oral health among pre-school children in Hulu Terengganu District, it was reported that use of animation technique enabled more complex concept been delivered more easily so that it can be easily understood and remembered. The results show that the level of knowledge, attitude and practice among the intervention group was higher than the conventional group, whereas in the present study, 55.5% of the respondents think that interactiveness of an online health education is less effective to the conventional method of health education.

In the present study, majority of the respondents are of the opinion that obtaining permission from authorities like schools and allocating time slots for doing online health education is difficult, whereas 30.8% disagreed and the rest 5.4% strongly disagreed that this was not the case. 65.1% thought online health education is less effective when compared to the conventional method of delivering health education.

The study was done among colleges all over India, representing the entire country. This study showed that even in unprecedented times online health education programs enabled the continuation of health education.

Limitations

The limitation of the present study was that in this cross-sectional survey the responses were participant's self-report.

Recommendations

Barriers to using Online health education will need oral health professionals to consider factors like low patient computer skills, unwillingness to use technology, and poor technical designs. Without appropriate information technology skills, patients cannot connect to the Internet, let alone access education materials from the Web. These barriers could be overcome by having more accessible Online health education through smartphone and mobile applications with user-friendliness. Several mobile applications have been available recently for health promotion and health intervention. Planning an effective oral health information system



model, proper training, online research community, government funding, an automated dental treatment planning system for all diagnoses, etc would remove critical barriers to solving important problems in dental informatics.

Conclusion

Online health education programs have enabled the continuation of health education during these unprecedented times. According to the perception of post-graduates, online health education is effective and feasible compared to the conventional method of health education. The evaluation results revealed the usability of this system. This is a good demonstration of perceptions and practices of online health education programs carried out by dentists. Of course, there still are deficiencies in this system, that needed to be enhanced according to the surveys, however, this study opens a window for providing more efficient patient education conducted by dentists via an information system. Once the barrier between the dentist and the technology is resolved, the bridge connecting innovations such as decision support, real-time data diffusion, and proceeding illumination in the context of practice will be opened.

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