



Original Article



Use of YouTube for Mastery of Clinical Skills in Dental Education

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ABSTRACT

The increasing integration of digital platforms has transformed the way clinical skills are taught in dental education. YouTube has emerged as a prominent resource, offering an array of instructional videos that can supplement traditional learning. However, the extent to which dental students in Pakistan utilize this platform for clinical skill acquisition remains underexplored, highlighting a significant gap in the existing literature. **Objectives:** To evaluate the utilization and effectiveness of YouTube as a learning tool for clinical skills among dental students and house officers. **Methods:** A cross-sectional survey was conducted with 150 dental students and house officers at Combined Military Hospitals, Lahore Medical College, Institute of Dentistry. House officers from other medical professions were excluded. The sample size of 150 was calculated through the M Calculator. Participants completed a 19-item questionnaire. The collected data were analyzed using SPSS version 26.0. For the data analysis, descriptive tests, frequencies, chi-square and the Kruskal Wallis tests were employed. **Results:** Most students (87.3%) solely depended on internationally produced videos. 26.7% of the participants used the platform for educational purposes. Only 44% of the participants used YouTube as a supplement to learn clinical procedures. 47.3% reported watching YouTube videos before their first attempt at a procedure. **Conclusions:** It was concluded that YouTube is a valuable source of learning and presents the necessity of incorporating technology-enhanced tools, such as YouTube, into dental schools.

INTRODUCTION

YouTube has transformed the practices of accessing information and learning skills, making it easier for professionals to enhance their expertise [1]. This transformation provides an exciting opportunity to enhance clinical education and patient care. The integration of technology in the world of education has opened pathways for pioneering new horizons. YouTube has evolved from an entertainment site into a key educational resource [2], especially in the field of dentistry, and it has been beneficial for both students and professionals [3]. YouTube as a platform offers an array of engaging instructional videos at all levels of education, and it covers a wide range of procedures and techniques in dentistry. Dental professionals experience an ever-increasing demand for advanced skills and knowledge, and

traditional teaching and learning methods can sometimes fall short of providing hands-on experience. YouTube addressed this gap by providing opportunities for students to learn from experienced clinicians across the globe who are capable of demonstrating complex dental procedures. The platform allows students to visualize anatomical structures and learn in-depth clinical procedures such as crown preparation and root canal therapies [4]. Precision and technique are the paramount aspects of dentistry; hence, the visual experience of procedures exponentially increases learning among students. One of the platform's strengths is that dental students learn at their own pace, with the ability to revisit challenging concepts as needed. Dynamic visual aids are replacing static images and traditional textbooks offering interactive, and innovative



demonstrations. Videos on YouTube should be updated regularly, according to recent developments in dentistry, to ensure students achieve adequate learning goals and have access to the latest knowledge. Students learn best by an image or video, making visual memory the strongest form of learning. This prepares them effectively for real-world clinical scenarios and contributes to achieving better patient outcomes by producing competent dental professionals [5]. Visual content reinforces comprehension and fosters deeper learning and understanding of complex techniques [6]. YouTube's accessibility and flexibility facilitate regular engagement, enabling students to tailor their learning experiences according to their pace [7, 8]. The platform has widely transformed the concept of dental education and allows educators of dental schools to produce dynamic lectures that include clinical scenarios to help them practice in real life [9, 10]. The students use supplementary resources like YouTube to master the clinical procedures [11]. The students have diverse learning needs due to varying learning styles and the traditional methods, such as textbooks and lectures, may not fully address them [12]. YouTube, with its visual and practical demonstrations, can bridge this gap, as it catalyzes collaboration within the dental community [13]. Educators worldwide may exchange ideas and progress in the profession by using instructional videos to share their knowledge and best clinical practices. This collaborative ethos encourages dental professionals to foster a culture of continual improvement and professional growth [14]. However, it is essential to validate and critically evaluate the content of YouTube. It is necessary to ensure the credibility and expertise of content creators on YouTube to guarantee the accuracy and relevance of the content presented. By prioritizing reliability and quality, students can maximize the educational benefits of YouTube while reducing the risk of misinformation. The use of YouTube videos for educational purposes has increased over time due to a radical force in dental education that provides a vibrant and easily accessible environment for learning, teamwork, and professional growth [15]. By utilizing the technology, dental professionals may seize new chances for quality and innovation in oral healthcare. There is little research done, despite its potential, on how reliable and successful YouTube is as a teaching and learning resource for dental students and professionals. This study aims to bridge that gap by providing valuable insights into how YouTube is being used by Pakistani dental students to enhance clinical skills. The findings can help to improve curriculum and guide teachers on digital platform integration for optimized learning experiences amongst students. This study aims to evaluate the utilization and effectiveness of YouTube as a learning tool for clinical skills among dental students and house officers.

METHODS

The data were collected following the approval of the Ethical Review Committee Combined Military Hospitals (CMH) Lahore Medical College (33/ERC/CMH/LMC). The purpose of the study was to evaluate the utilization of YouTube videos for mastering clinical skills among these participants using a questionnaire. Participant selection was done from clinical years i.e., Third and Final Year, and House officers at CMH Lahore Medical College & Institute of Dentistry. Informed consent was obtained from all the participants and recruitment was conducted through a convenience, non-probability sampling technique. The data were collected between August 2024 and September 2024 via anonymous survey links to ensure confidentiality and reduce social desirability bias. Reminders were deployed after every 1 or 2 weeks during the study period. No incentives were given to the participants. Data analysis was done on SPSS version 26.0. Descriptive statistics, including frequencies and percentages, were calculated to provide an overview of responses and to assess whether the responses differed significantly based on the stage of dental education. The chi-square test was used to evaluate differences in categorical variables e.g., Gender, and YouTube usage frequency. The Kruskal-Wallis test was performed to assess differences between groups based on stages of dental education. A significance level of $p < 0.05$ was considered statistically significant.

RESULTS

A total of 150 dental students participated in the study, with a mean age of 21.2 ± 11.2 years. The gender distribution is shown with male representing 60% and female accounting for 40% of the participants (Figure 1).

Gender Distribution

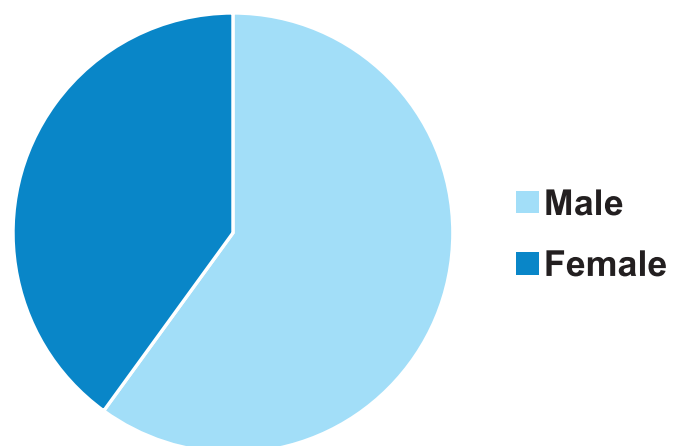


Figure 1: Gender Distribution

The majority of the participants were final-year students (41.3%), followed by third-year students (31.3%) and house officers (27.3%) (Figure 2).

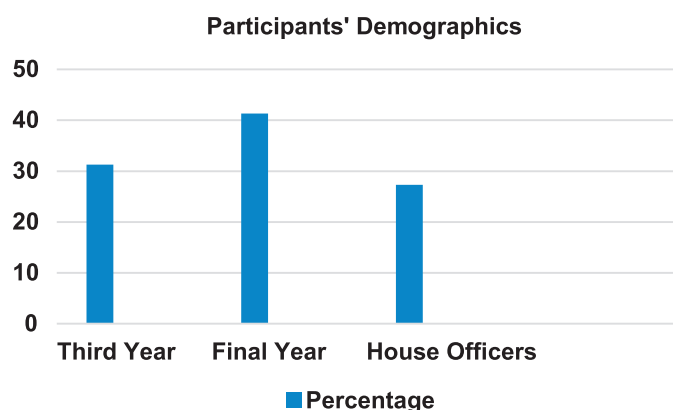


Figure 2: Participants' Demographics

Most students (77, 51.3%) were younger than 23 years of age. Most students (121, 80.7%) had been using YouTube for more than five years, while a smaller proportion (21, 14%) had used it for 3 to 5 years. Only 6 (4%) had been using the platform for 1 to 3 years, and 2 (1.3%) had less than one year of experience. Regarding the frequency of YouTube usage, 73.3% of the students accessed the platform daily, 20.7% weekly, and only 5.3% monthly. A very small portion (0.7%) used it annually. The responses provided by the participants regarding their primary purpose of using YouTube have been illustrated (Figure 3).

Primary Use of YouTube

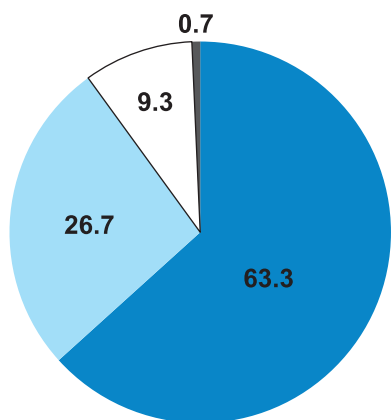


Figure 3: Primary Use of YouTube

YouTube was widely used by students to supplement their learning of clinical procedures. Specifically, 66 students (44%) used it as an adjunct to lectures and labs to explore different approaches, while 57 (38%) relied on YouTube when they missed classes or lab sessions. A smaller group (18, 12%) considered YouTube as their main learning resource. Notably, 9 students (6%) used YouTube to better understand procedures due to language barriers, as English was their second language. In terms of procedural preparation, 71 (47.3%) students reported watching YouTube videos before attempting a clinical procedure for the first time, while 38 (25.3%) used it consistently for every procedure. When asked about the likelihood of using YouTube for unfamiliar procedures, 61 (40.7%) were "very

likely" and 58 (38.7%) were "likely" to do so. The most commonly prepared procedures included removable prosthodontics (42, 28%), fixed prosthodontics and endodontics (32, 21.3% each), and restorative procedures (21, 14%). Less frequently, students used YouTube for prophylaxis/periodontics (11, 7.3%) and oral surgery (extractions: 6, 4%; suturing: 3, 2%)(Table 1).

Table 1: YouTube as a Tool to Learn Clinical Procedures

YouTube	Learning of Clinical Procedures	Students (%)
How do you use YouTube as a Learning tool for clinical procedures? (choose all that apply)	YouTube is my main learning tool	18 (12.0%)
	Adjunctive to lectures/labs as a way to learn different approaches	66 (44.0%)
	When I miss class / lab and need to learn a procedure	57 (38.0%)
	English is my second language and I rely on YouTube to better understand the procedure	9 (6.0%)
I watch YouTube videos (s) as a learning tool before attempting a clinical procedure.	Always, when I prepare for any clinical procedure	38 (25.3%)
	Only before my first time attempting a clinical procedure on a patient	71 (47.3%)
	Rarely, when I need a refresher on a clinical procedure I haven't done in a while	38 (25.3%)
	Never	3 (2.0%)
you to refer to a YouTube video to prepare for a clinical procedure that you have never done?	Very unlikely	4 (2.7%)
	Unlikely	9 (6.0%)
	Neither likely nor unlikely	18 (12.0%)
	Likely	58 (38.7%)
	Very likely	61 (40.7%)
Which types of dental procedures Are you prepared to use YouTube? (choose all that apply)	Removable Prosthodontics	42 (28.0%)
	Fixed Prosthodontics	32 (21.3%)
	Restorative	21 (14.0%)
	Prophylaxis/ Periodontics	11 (7.3%)
	Endodontics	32 (21.3%)
	Oral surgery- Extractions	6 (4.0%)
	Oral Surgery- Suturing	3 (2.0%)
	Radiographic Imaging / Radiographic Interpretation	3 (2.0%)
Which of the following aspects of learning do you feel YouTube videos are most helpful?	Concept understanding / visualization of abstract concepts	77 (51.3%)
	Clinical demeanor / professionalism	20 (13.3%)
	Clinical procedure technique	32 (21.3%)
	Organization / planning	21 (14.0%)

Most students 131 (87.3%) utilized internationally produced YouTube videos as their primary source for learning clinical procedures, whereas only 19 students (12.7%) engaged with content generated in Pakistan. Most participants (138, 92%) would recommend YouTube as a learning tool for clinical procedures. Additionally, 105 students (70%) indicated that faculty members from the dental school had endorsed YouTube as a valuable component of their learning process. When asked about the evidence base of YouTube videos, 75 (50%) found the content to be "very much" evidence-based, while 67 (44.7%) considered it "somewhat" evidence-based. Only 8 (5.3%) were unsure.

Regarding alignment with dental school curricula, 69(46%) found YouTube content to be "very reflective" of their formal education, and 73 (48.7%) found it "somewhat reflective." Engagement with YouTube videos was limited, with only 15 students (10%) regularly posting comments, while 47 (31.3%) did so occasionally, and 88 (58.7%) never engaged in commenting. Additionally, 136 students (90.7%) had never uploaded their instructional videos, though 130 (86.7%) expressed a desire for their dental school to post tutorials on YouTube or other social media platforms (Table 2).

Table 2: YouTube Video Sharing and Validity among Study Participants

Validity of YouTube Video	Yes	No	Preferences
Would you recommend YouTube as a learning tool for clinical procedures to your classmates?	138 (92.0%)	9 (6.0%)	3 (2.0%)
Has your dental school faculty ever recommended you to use YouTube for your learning process, as it relates to clinical procedures?	105 (70%)	45 (30%)	113 (8.7%)
Would you like for your dental school to post tutorials on clinical procedures on YouTube / social media?	130 (86.7%)	7 (4.7%)	
Degree of Using YouTube Videos	Very Much	Somewhat	Unsure
To what degree do you find YouTube videos as a tool for learning clinical procedures to be evidence-based?	75 (50%)	67 (44.7%)	8 (5.3%)
To what degree do you find YouTube videos as a tool for learning clinical procedures to be reflective of what you are taught in dental school?	69 (46.0%)	73 (48.7%)	8 (5.3%)
Watch for Learning	Always	Never	Sometime
Do you ever post comments on the YouTube videos? Do you watch for learning clinical procedures?	15 (10%)	88 (58.7%)	47 (31.3%)
Do you ever upload your instructional videos to YouTube?	14 (9.3%)	136 (90.7%)	
Where are the YouTube videos that you use as a learning tool? (Choose all that apply)	Nationally	19	12.7
	Internationally	131	87.3

The findings of this study highlight the significant role of YouTube as a valuable learning tool for dental students, emphasizing its potential to enhance clinical education and support diverse learning needs within the curriculum.

DISCUSSION

In recent years, integrating digital platforms into educational frameworks has significantly transformed the way medical and dental training is delivered worldwide [16]. Globally, YouTube has become an essential tool for students and professionals in various fields, offering a

dynamic and accessible medium for learning [17]. YouTube is a cornerstone in medical education, due to its visual content, interactive nature and availability of a vast library of clinical demonstration videos [18]. The dental students are employing YouTube for learning and are contributing to digital growth in Pakistan. While digital literacy dwindles in the region, dental schools are slowly adapting digital resources to enhance the learning experience. The accessibility and flexibility of YouTube are significant advantages that traditional teaching methods and curricula fail to provide due to inherent resource limitations and rigid educational frameworks [19-21]. Focusing specifically on the region of Punjab, where this study was conducted, dental education has seen significant strides in incorporating technology. The findings of this study highlight that dental students in Punjab rely heavily on YouTube to reinforce their learning. A substantial percentage of participants reported using YouTube not just to revisit procedures but also to explore diverse approaches to clinical challenges. This demonstrates that students in Punjab, like their global counterparts, are turning to digital tools to enhance their clinical competency. The findings align with international research that highlights YouTube's role as a valuable educational tool for dental and medical students. For instance, a study noted that over 80% of medical students utilize YouTube for clinical preparation, similar to the 87.3% of participants in our study who found it beneficial for mastering dental procedures [22]. Azer emphasizes the importance of critically evaluating YouTube content, as half of our respondents deemed it "very much" evidence-based, reflecting the need for cautious content selection [23]. Visual learners benefit significantly from YouTube's step-by-step demonstrations, which align with our results on procedural learning. Moreover, the uneven quality of YouTube videos in dental education mirrors our concerns regarding content reliability [24-26]. Lastly, it was noted that students prefer using videos as adjuncts to traditional training, further reinforcing our findings that YouTube is primarily used alongside formal education. Overall, these studies confirm that while students in Punjab are leveraging YouTube for learning, they share common concerns with their global counterparts regarding content credibility. However, unlike studies in other regions where the engagement levels with YouTube (e.g., commenting, uploading content) were slightly higher [27], the limited interaction reported by students in this study suggests that the dental community in Punjab may not yet be fully utilizing the collaborative potential of YouTube. Encouraging greater interaction could further enhance the learning experience and foster a more active, collaborative educational environment within the region. The impact of this study is multi-faceted. First, it addresses a data gap in the area by offering actual proof of the substantial influence YouTube has on dental education in Punjab. The

current study enlightens how much dental students and professionals rely on YouTube for clinical procedures and it emphasizes how important is it to incorporate digital resources for learning. Lastly, this study may encourage dental schools to create and disseminate their educational materials on platforms like YouTube ensuring that students may have access to resources that are need specific.

CONCLUSIONS

It was concluded that the current study illustrates the profound impact of YouTube as an evolving tool in dental education, particularly among students. The findings demonstrate a strong dependence on YouTube for enhancing knowledge and clinical skills, indicating that it can effectively supplement traditional educational methods. Dental schools should consider formally integrating digital resources like YouTube into their curricula to optimize learning experiences and ensure that students engage with high-quality, evidence-based content.

Authors Contribution

Conceptualization: MAQ

Methodology: MAQ, SK, AR

Formal analysis: HM

Writing review and editing: KAM

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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