Original Article

WhatsApp as a Tool in Blended Learning in Dental Education

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ABSTRACT

Background and Objective: Dental education is unique, with clinical/practical learning much different from other professionals. In dentistry, students are exposed much earlier in their curriculum to patients, performing procedures under direct/indirect supervision. Hence, the present review attempted to assess the standing position of dentistry in blended learning worldwide. **Materials and Methods:** E-learning modality was at its primitive stage as food for thought among educational task force committees, with only a handful of developed and developing countries equipped with it. During this pandemic, "WhatsApp" became a savior, as it was a widely used educational device among dental teachers and students. Furthermore, it was easily applicable in places where there was difficulty in obtaining regular internet bandwidth, especially in remote/rural areas. It is noteworthy that blended learning/e-learning, when complemented with the conventional teaching method, upskill critical thinking and problem-solving capabilities. Blended learning or virtual reality education should be made feasible without disparity, worldwide. Mind training, both students and staff in hybrid e-learning, is the need of the hour not only to keep pace with digitalized dentistry but to prepare the students to face real-world situations. **Conclusion:** The sustainability of dental education should be rethought by dental schools with "Complimented Digital learning" wherever feasible, not only to cope with current trends but also to face unforeseen future challenges.

KEYWORDS: *Blended learning, covid, dentistry, pandemic, WhatsApp*

INTRODUCTION

The present era of advanced technology necessitates changes in the implementation of the dental curriculum.[1] It is essential to achieve a poised "teaching-learning" curriculum as education evolves. Novel educational technologies, if tapped properly, can be an efficient tool in teaching-learning activities.

Several containment measures to stop the spread of the deadlier pandemic – severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) – were recommended worldwide. One immense requisite being social/physical distancing was highly recommended, especially in educational institutions. In particular, dental education has been suspended nearly worldwide.[2-4] Further, with the discovery of the SARS-CoV-2 virus, this pandemic urged nations worldwide to impart the "learn from home or work from home" concept to break the chain of transmission and bring the situation under control.

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E-learning trends in out-resourced, developing, and developed countries

Universities are still gatekeepers of knowledge in many middle- and low-income countries offering traditional education methods in health sciences.[5] As pointed out by Ferro in 2019, universities are knowledge providers, with students listening to what their facilitator or professor is willing to share.[1] This phenomenon became the roadblock for dental professionals to think beyond the teacher's knowledge.[6]

The active learning method is transforming education; that too, mobile learning (M-learning) outweighs

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other technologies available. This wireless, extremely portable, allows a collaborative environment for sharing knowledge and experiences beyond traditional lectures in messages, quizzes, and multimedia contexts. Numerous works of literature strongly recommended that M-learning kindled academic interest when incorporated into health sciences as an adjunct to didactic lectures.[7-9]

E-learning has attracted millions of people worldwide with varied affordability in the technological domain. It led to an easy learning climate among students and facilitators.[10] implementing collaborative/engaging educational strategies is directly linked to "Positive" student outcomes.[10,11]

E-learning was at a primitive stage of food for thought among educational task force committees, with only a handful of developed and developing countries equipped with it. However, during this pandemic, Universities made strategies to continue their academics, complying with the need for social distancing and leaving behind internet-based teaching/e-learning activity as the only feasible option globally.[12] More precisely, the educational institutions/task forces were handicapped, and the facilitators/teachers were helpless.

The pandemic was not the same for everyone. It was of utmost importance to understand that the pandemic exceptionally not only compromised the educational domain but also imposed grudges in the social, psychological, and economic environment among students and facilitators. A recent meta-analysis declared high-level depression prevalence among dental students compared to other professional college students. Further, Asian continent dental students had higher depression scores than those from the European and American continents.[13] Hence, above all factors were to be taken care of when implementing educational curriculum during the pandemic.

The academic sector witnessed or compelled sudden changes in teaching modalities worldwide without compromising the quality of education.[14,15]

The rationale behind this review

The present scoping review's rationale is that blended learning, that is., integrating online sessions with traditional didactic lectures, has been extensively used in health sciences in developed countries.[2,16,17] Students blended learning (BL) insights varied across nations.[18,19] However, it becomes pretty challenging in developing countries as numerous factors are involved in online teaching. Learners' perception is a critical factor in implementing online education. E-learning success is entangled with the readiness of particular professional students to accept it. Hence, the present work targeted to assess the role of e-learning, particularly the part of WhatsApp blended learning in dentistry during pre and post-COVID time and its implication in the future.

COVID-19 pandemic and E-learning

With the limited resources available in the workforce, money, and facilities complimented with an urgent need to find the solution, the choice fell upon "WhatsApp" in middle- and low-income countries to continue their education. Mobile learning was a remediation strategy to cover academic portions during this lockdown.[12]

Numerous pieces of evidence suggest it is a viable tool for undertaking group work, facilitating participatory learning to cover up short working hours.[5,20] In his work during the pandemic among pharmaceutical and medical science undergraduate students in Cameroon, Enyama recommended incorporating WhatsApp e-based learning as an adjunct to conventional didactic lectures after drafting a blended learning strategy in health sciences.[12]

Mobile learning in health sciences

The application of smartphones in the medical field has gone a long way during the COVID-19 pandemic. M-learning is an effective learning device as it can be used anytime and anywhere. Medical and dental professionals use many information technology applications in teaching and caring tasks, surgery, monitoring, etc., Though the internet budget was a problem, it was still a cost-benefit model for most when weighed against other factors (e.g., transport facilities) in private sectors.[12]

Numerous pieces of evidence support the positive role of smartphone-based learning among medical and dental students worldwide.[21-23]

Dental clinical/practical learning is much different from other professionals. Students are exposed much earlier in their curriculum to patients, performing procedures under direct/indirect supervision, placing the sole responsibility on clinical teachers.[24] Hence, clinical dental education is unique.[25]

Interactive online sessions can be customized to individuals' learning styles.[26,27] Further, students felt mobile-based learning makes them more independent and out of monopoly traditional educational methods.[23]

WhatsApp: A blended teaching modality in dentistry

"WhatsApp" became a savior as it was widely used among teachers and students.[28,29] In dentistry, WhatsApp is the most commonly used educational device for dental students. Furthermore, it is applicable in places where there was difficulty obtaining regular internet bandwidth, especially in remote/rural areas.[12]

WhatsApp develops clinical skills regardless of country of origin. It is proven to be an adequate tool for higher education applicable to dentistry. WhatsApp is a newly evolved tool of this century that has been effectively tapped in various fields of dentistry.[30]

To move on, education is one of the critical sectors responding to the challenges of the time. The skill set of any professional is decided by the critical thinking an individual has. It is noteworthy that blended learning/ e-learning, when complemented with the conventional teaching method, upskill critical thinking and problem-solving capabilities. Further, multiple shreds of evidence were revealed. WhatsApp-based learning could improve critical thinking skills.[31]

The core role of WhatsApp in health sciences education is immense, at least in the time of the pandemic. To begin with, in Pakistani higher education settings, e-learning is a new normal phenomenon after the COVID-19 pandemic. A recent study conducted among Doctor of Pharmacy (Pharm-D) students found that social networking applications were effective communication and teaching tools.[32] A focus group discussion among health sciences students revealed that online learning/ e-learning gives them the flexibility of learning time and enables slow learners to repeatedly learn/view and understand the contents without having anxiousness of absenteeism.[33,34]

WhatsApp finds its application in dentistry with its unique feature, "storing the information, allowing users to have their autonomy, revisiting the information anytime, anywhere, and diagnosis/interpretation of clinical conditions, radiological findings efficiently compared to conventional teaching methods."[20]

WhatsApp-based learning effectively taught, educated, and assessed undergraduate curriculum in dentistry. WhatsApp-based e-learning for radiodiagnosis of clinical diagnosis among Italian and Indian dental professionals revealed an effective method for diagnosis and treatment planning among students and personnel working in remote community camps.[30-35] Almost entire (98.6%) of dental students found the correct interpretation of dental radiographs than their control group taught by conventional methods.[36] Sarode, in his work on community surveys, declared that WhatsApp-based second opinion diagnosis is an efficient method to overcome the problem of diagnostic delays in oral cancer screening.[37] There are numerous advantages of sharing, reviewing pre and postoperative clinical pictures, radiographs, and treatment planning between the trainers, postgraduates, and dental surgeons using WhatsApp technology. It also helped achieve digital archives of surgical cases that can be retrieved and reviewed for treatment and teaching. Another prospective analytical study conducted among 4th-semester Bachelor of Medicine, Bachelor of Surgery (MBBS) students revealed that the combination of WhatsApp and conventional didactic lecture showed a significant increase in knowledge among budding doctors.[38]

WhatsApp-based e-learning gave mixed results. A recent multicentric study done among dental undergraduates and graduate students revealed WhatsApp as practical and helpful in developing their clinical skills. Further, it is firmly accepted that WhatsApp can complement traditional lectures and enrich their clinical experience. The study further concluded that M-learning should complement rather than replace traditional methods.[39] Qualitative research done among various private and government dental institutions in Turkey during the first wave of the SARS-CoV-2 pandemic revealed they were comfortable with e-learning. However, they are not without compromises like increased hours of screen time, which increased from 1–3 h usually to 4–6 h, and lack of sufficient internet facilities and computers for attending online sessions.[40]

Further, when used for assisted English language learning among Iranian dental students, WhatsApp was found to be an effective tool. The author further remarked that students are "digital natives." Therefore, passive learning alone becomes inappropriate, and complementing it with e-learning will be highly productive.[5]

WhatsApp as blended learning – Another side of the coin

Studies with positive notes declared it as a source of communication. However, the other side of the coin with the negative message was reported by numerous authors, starting from low-grade ranking, decreased concentration however, the other side of the coin with the negative message was reported by numerous authors, starting from low grade ranking, decreased concentration, and a waste of their time.[10]

Evidence also refutes that WhatsApp only enhances superficial learning.[41] An interventional study among informatics students using Edmodo-based flipped classrooms as one group and WhatsApp-based learning as another revealed that interactive flipped classrooms increased overall performance in terms of confidence, self-control, improvisation, wisdom, and content-controlling supervising students rather than non-interactive web-based learning. It is noteworthy that non-interactive teaching, that is, WhatsApp, too, showed an increase in individual values in above all domains.[42] Previous literature had summarized that

the creativity and innovations of both the students and facilitators did not improve in the WhatsApp method of teaching, demanding a change from the old to the new that is more effective.[43,44] A study between dental and non-dental students about COVID-19.

Though students had a positive attitude towards online learning, they were neutral about the efficiency of online courses, especially dental professionals, when questioned: "whether e-learning can be made the future format in the dental curriculum?"[45] However, as the authors surveyed, only one dental school questioned the external validity. Dental students are more worried about their financial situation as most dental schools have high tuition fees than non-professional courses. When asked about e-learning, dental students were comfortable with general dental lectures but not lab/clinical format.[45] A multicentric exploratory study done among medical college students in Riyadh revealed that WhatsApp learning is as efficacious as didactic, and blended learning (WhatsApp and didactic lecture combo) had a positive note on students' grades.[46] Social network frivolous time-wasting, a distraction from work, compromised physical and mental health, skipping meals, improper rest, passive attitude, and depression cannot be forgotten.[46] Akin to previous work, a novel approach of asynchronous learning among dental students comprising debated discussions on clinical problems and synchronous teacher-facilitated discussion among UK dental students during this pandemic acknowledged more student-centered experience but voted face-to-face patient care is inevitable for a complete learning experience.[24]

However, limited internet facilities, getting distracted when lectures/videos are bombastic and long, the all-time availability of facilitators to clarify doubts, musculoskeletal problems, eye staining, and more time to understand the contents were sometimes the disadvantages of blended learning.[34]

Is blended learning – The need of the hour?

In many developing and outsourced countries, the standard method of education is Memorization rather than problem-solving. As a result, facilitators had limited pedagogical skills to engage and kindle their students' higher-order thinking skills.[47]

Practical learning includes lower/higher-order thinking skills. By training students to apply skills during their curriculum, innovations become more accessible and economical. Globally, evidence has been reported that WhatsApp-based learning activates higher-order thinking skills.

Hence, blended learning or virtual reality education should be feasible without disparity worldwide. Mind training, both students and staff in hybrid e-learning will help keep pace with modern technology and face the future pandemic in an efficient way.

Studies reported online teaching-learning readiness of students in private and urban areas. Future studies of various geographical locations/sectors should be warranted to get a comprehensive view of e-learning. Hence, while designing blended learning and customizing it based on perceived barriers/challenges of students, institutions and governing bodies should be taken care of regionally.

Blended learning – Its role and recommendations in dentistry

E-learning depends on an individual's self-learning goals, educational content, and designed tools for learners in a diverse environment.[40] As pointed out in earlier works, e-learning best fits into dental curriculum teaching as it encompasses both hardware and software applications.[48]

As dental education includes more practical/clinical sessions than academic curriculum, e-learning has escalated the anxiety of students.[49] Hence, while planning future programs, both didactic and e-learning should go hand in hand.[40]

Firstly, it should be recommended that countries with enough resources, that is, technology and workforce, should equip themselves with e-learning in future dentistry. Further international cooperation is needed to fill the inverse care law in out-resourced countries among policy aspirants in implementing e-learning at grassroots levels. Facilitate developing countries in this prospect. Secondly, if facilitators do not have a good hold of online teaching or necessary infrastructure, e-learning will be a compromised material for the receiver.[40] Hence, facilitators should be equipped with technological support, centralized online guidance, and trained in new pedagogical approaches. Thirdly, the majority of the evidence assessed only the learner's perspective. Eliciting the challenges and opportunities of mentors, universities, and the government is warranted. Finally, dental simulation/blended curriculum, wherever feasible, should be implemented.

Conclusion

The present era of digital dentistry makes digitalized dental education inevitable. As technology reigns, it is essential to move forward with e-learning/M-learning wherever appropriate to complement traditional dental education models. Moreover, a recent review remarked

that dental education faced an almost similar climate during this pandemic globally.[17] A deeper look into the above statement can be substantiated by a study conducted in the South Asian region, which denotes the present scenario of e-learning in out-resourced countries; though not immediately feasible due to the economic burden, WhatsApp still holds to be an efficient platform.[50]

Newer technologies permit us to experiment with a plethora of experiences across different borders and cultures worldwide to overcome the potholes of comprehensive dental teaching in traditional/orthodox methods. However, the handicap of transferring clinical/practical skills by digital learning makes the traditional method a prime teaching method, at least in dentistry.[17]

Primordial prevention is the best method to reduce the global oral disease burden. Hence, dental training professionals in health promotion can be made easier and viable with this e-learning platform.

Throughout the ages, nature has always been trying to teach humankind unpredictable lessons like the COVID-19 pandemic. Like Darwin's "Survival of the fittest theory," sustainability of dental education should be rethought by dental education authorities with "Complimented Digital learning" wherever feasible, not only to cope with current trends but also to face unforeseen future challenges.

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Conflicts of interest

There are no conflicts of interest.

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