

## Digital Media: A Trendsetter in Surgical Learning

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Received: 25-12-2022 / Revised: 25-01-2023 / Accepted: 28-02-2023

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Conflict of interest: Nil.

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### Abstract:

**Background:** Digital media is an efficient, immediate, accessible and potentially inexpensive medium for the widespread publication, sharing and discussion of educational material, therefore, it is gaining popularity among the medical sector as an electronic learning platform. However, there are many benefits, and also certain limitations to use of digital media as education tool. This study was conducted to audit the use of digital media by surgeons and its potential as an education tool.

**Methods:** We conducted this online survey among the surgeons for a period 7 months under the Department of General Surgery, Tertiary Care Hospital in Rural Northern Maharashtra. The online questionnaire containing 25-items, probed the specifics of digital media use for surgical education. It was created using google forms. The validity of the questionnaire was assessed by 10 independent faculties and the Cronbach alpha for questionnaire was 0.89. This questionnaire was posted on Facebook groups, few professional Instagram pages and closed surgical groups on WhatsApp. The collected data was entered in the MS excel spread sheet and the descriptive analysis of the variables was done using the same.

**Results:** Respondents included were practicing general surgeons (54%), orthopedic surgeons (16%), gynaecologists (8%) and other specialists and super specialists. Most common purpose of digital media use was learning and teaching both (58.7%). YouTube (90%) was most preferred digital media application followed by WhatsApp (57.5%), Facebook (52%), Pubmed (47.5%), Slideshare (47.5%) google platforms (42.5%) and Instagram (20.5%). Operative surgery videos (89.5%) and live teaching videos (61.5%) were found most useful. Majority felt digital media was helpful for surgical learning (91%) and it is helping them to learn surgery fast (43%). However, many also believed that conventional learning is superior (72.5%) and irreplaceable (73.5%).

**Conclusion:** Despite many accepted advantages digital media has not gained trust of surgical fraternity to become main learning tool and is continuing to serve as a complementary tool in surgical learning.

**Keywords:** Digital Media, Social Media, General Surgery, Education, E Learning, Online Teaching.

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## Introduction:

Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content; and, in some cases, to collaborate with other users in real time is referred to as “digital media”. [1]

Digital media is an efficient, immediate, accessible and potentially inexpensive medium for the widespread publication, sharing and discussion of educational material, therefore, it is gaining popularity among the medical sector as an electronic learning platform. [2] Use of digital media for learning has got a boost after significant reduction in internet prices in recent past in India.

Healthcare professionals including surgeons can use digital media for professional networking, organizational promotion, patient care, patient education and public health programs, apart from learning.

It is well accepted among surgeons that they need to be more efficient in their time management, to keep updated with an ever-increasing volume of knowledge with simultaneously obtaining the procedural experience. Reportedly according to literature, there is an increased engagement with specialty hash tags and increased utility of digital media by surgical fraternity. [3]

COVID-19 pandemic has explored the capabilities of electronic or online learning as a professional educational tool. For the first time, there was a collection of speakers and influencers from around the globe providing presentations to attendees from around the globe at significantly lower costs for organizers and participants. [4]

Various digital media platforms used in India for Surgical education are LinkedIn

(2003), Facebook (2004), YouTube (2005-6), Twitter (2006), WhatsApp (2009), Instagram (2010), Zoom (2011) and others. YouTube has become very popular for sharing live surgical videos and video blogs, and WhatsApp for conversations as well as sharing academic as well as non academic contents. Twitter is a very popular micro blogging platform, which allows surgical societies and individual surgeons to share short text messages, pictures, and links worldwide. The social networking site Facebook has provided a platform for healthcare professionals to share their experiences and discussions in the restricted “closed groups”. The International Hernia Collaboration, Robotic Surgery Collaboration, SAGES (Society of American Gastrointestinal and Endoscopic Surgeons), colorectal surgeons, and others have utilized closed Facebook groups to accumulate clinical and research data, for discussions and sharing advice. It is also used to post manuscripts, lectures, and difficult surgical cases. [5] Zoom video communication app has become mainstream digital media app in surgical learning for conducting online webinars, lectures and departmental meets.

Though digital media have brought surgical learning to our doorstep but certain limitations like lack of hands-on experience, biased information, patient’s privacy, internet network issues and most importantly distractions, makes its use difficult for young surgeons as an education tool. [6] However there is very less data evaluating the uses, benefits and limitations of digital media. This internet-based survey study was conducted to evaluate the use of digital media by surgeons and its potential value as a tool of surgical education.

## Materials and Methods

We conducted this online survey among the surgeons (general surgeons, orthopedic surgeons, gynaecologists, oncosurgeons, plastic surgeons, ear, nose and throat surgeon, ophthalmologists, neurosurgeons and other specialties and super specialties) for a period 7 months during 1 January 2021 to 31st July 2021. The study was conducted at the Department of General Surgery, Tertiary Care Hospital in Rural Northern Maharashtra. An institutional ethical board approval was not required. This study did not require human subject research or use of protected health information. The online questionnaire containing 25-items probed the specifics of digital media use for surgical education. It was created using google forms. The questionnaire had mixed type of questions which included short answer questions, leading questions and multiple-choice questions. The google forms also collected the baseline details of the participants (name, age, and profession). All the questions were created in the English language and edited by two other authors. The validity of the questionnaire was assessed by 10 independent faculties and the Cronbach alpha for questionnaire was 0.89. The questionnaire was then piloted among ten faculties to check the comprehensibility and the suggested changes were made to avoid ambiguity.

This questionnaire was posted on Facebook groups, few professional

Instagram pages and closed surgical groups on WhatsApp. Only one entry per respondent was allowed. The Participation was voluntary, and no compensation was offered to the survey participants. The investigators and the aims of the study were informed to the Participants through an introductory section in the questionnaire. The informed consent of participants was also obtained which was attached in the questionnaire after introductory section. The participants were requested to complete the questionnaire within 1 month of receiving it and 3 reminders were sent at an interval of 1 week, if the participants were not responding.

The collected data was entered in the MS excel spread sheet and the descriptive analysis of the variables was done using the same.

## Results

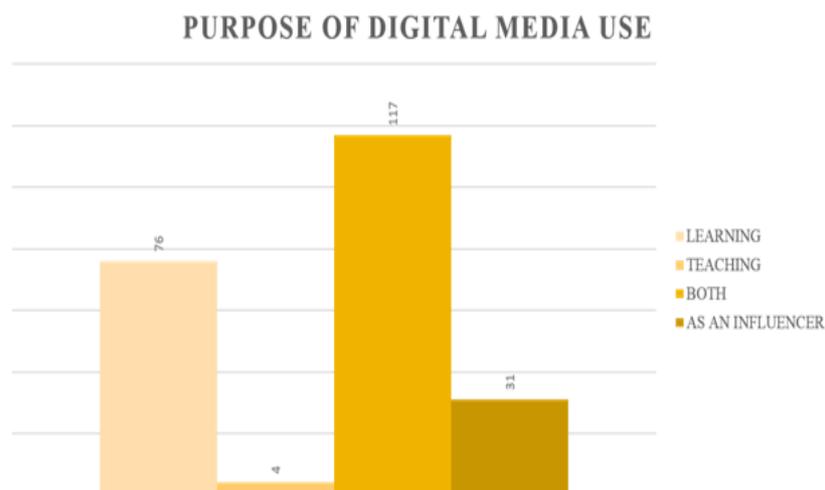
The online survey was completed with 200 responses after excluding incomplete responses and responses from non-surgical fraternities. Only single response was allowed for each respondent. Respondents included were practicing general surgeons (54%), orthopedic surgeons (16%), gynecologists (8%), oncosurgeons (6.5%), plastic surgeons (4%), ear, nose and throat (ENT) surgeon (2.5%), ophthalmologists (2.5%), neurosurgeons (2%) and other specialties and super specialties. Most were male (88%). The most common age group was 31–40 years (Table 1).

**Table 1: Demographic data of survey respondents.**

	Total	200 (100%)
<b>Gender</b>		
	Male	176(88%)
	Female	24(12%)
<b>Age</b>		
	21-30	63(31.5%)
	31-40	67(33.5%)
	41-50	46(23%)
	51-60	16(8%)
	61-70	8(4%)

Profession		
	General Surgeon	108(54%)
	Orthopedic Surgeon	32(16%)
	Gynecologist	16(8%)
	Oncosurgeon	13(6.55)
	ENT	8(4%)
	Ophthalmologist	5(2.5%)
	Neurosurgeon	5(2.5%)
	Urologist	4(2%)
	Pediatric Surgeon	3(1.5%)
	Surgical	3(1.5%)
	Gastroenterologist	2(1%)
	Cardio-thoracic Surgeon	1(0.5%)

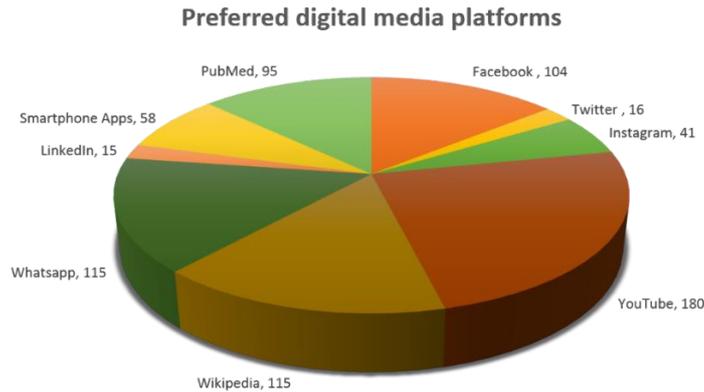
Purpose of digital media use amongst surgeons was mostly for learning and teaching both (58.5%) (Figure 1).



**Figure 1: purposes of digital media use by respondents.**

When asked which specific digital media platforms were preferred more often for surgical learning, the video sharing site YouTube (90%), the messaging app WhatsApp (57.5%), Facebook (52%), Pubmed (47.5%), Slideshare (47.5%) google platforms (42.5%) and Instagram (20.5%) were most popular. The category

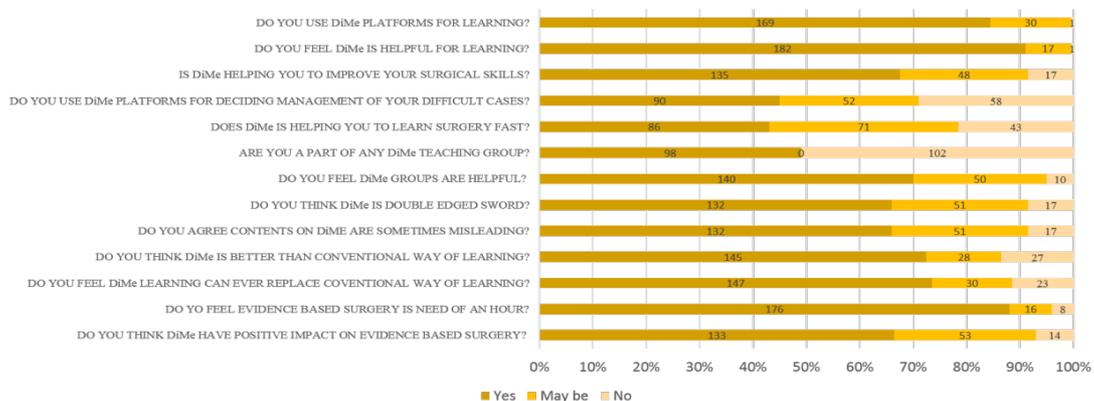
“other” included Twitter, Wikipedia, smartphone applications, and LinkedIn. Most respondents found operative surgery videos (89.5%) and live teaching videos (61.5%) were most useful followed by short Vlogs (13%), blogs (9%) and podcasts (6%). (Figure2).



**Figure 2: Preferred digital media platforms used for surgical education by respondents.**

Majority felt digital media was helpful for surgical learning (91%) and many also accepted that they take help of digital media often to decide management of their complicated cases (45%) and digital media is helping them in learning surgery fast (43%). Almost half of the respondents were part of digital media teaching groups (49%) and many strongly agreed that such groups are helpful in surgical learning (70%). Despite accepting various advantages of digital media use in surgical learning, many surgeons agreed

that contents on digital media are sometime misleading (66%), it is not better and will never replace conventional way of learning (72.5% and 73.5% respectively). Majority agreed that evidence based surgical practice is a need of an hour (88%) and digital media may or may not affect evidence based surgery (66.5), however 26.5% felt digital media has positive impact and 7% felt that it has negative impact on evidence based surgical practice (Figure-3).



**Figure 3: Responses to the questionnaire on Digital Media (Di Me) use and its potential as surgical education tool by the respondents.**

**Discussion**

Digital media platforms have evolved as an effective tool for sharing knowledge and opinions. It has also become instrumental in connecting, sharing and mentoring, thus making digital media effective tool for educating the next generation surgeons. [7]

This study was designed to evaluate digital media use by surgical fraternity practicing in India. Majority were using some form of digital media platform for surgical learning. Most common purpose of digital media use was for learning and teaching both, also, 31 surgeons were

using digital media platforms as an influencer.

A multi-institutional survey-based study by Wagner et al., observed that majority of respondents were using some form of Digital media for professional purposes. They consider Digital media participation is potentially beneficial to professional development. [8]

The studies by Asyyed et al., Attai et al., Hill et al., Markham et al., and Choinski et al., have a recent increase in use of online platform for professional networking purposes in surgical fields. [9,10,11,12,13]

A survey conducted by the American College of Surgeons (ACS) in September 2010 to assess the patterns of use of digital media by its members showed that a substantial percentage engages in digital media sites such as Facebook, Twitter, and LinkedIn. [14]. Newer popular platforms like Whatsapp, Instagram, Zoom etc. has driven more surgeons towards digital media use.

In a survey-based study by Lima et al., observed increasing use of digital media during COVID19 pandemic for the purpose of surgical learning, most used platform was You Tube (33.3%) followed by video conferencing platforms like zoom, google meetings etc. (22.4%), WhatsApp (21%), Instagram (13.7%), Facebook (8.7%) and LinkedIn (1%). Live webinars with chats (68.5%), live streaming videos (17.03%) and “Instagram lives” (60.4%) were more preferred digital media format for learning general surgery. [5]

Facebook and Instagram have been popular in other surgical specialties, including plastic surgery trainees for personal use in the study by Cho et al., (Facebook 86.9%, Instagram 77.7%), and in the study by Zerrweck et al., it was among bariatric or general surgeons for personal use (Facebook 80.3%, Instagram 27.1%). [15,16] In the studies by Mogul et

al., and Lugo-Fagundo et al., Facebook was considered the dominant Digital Media platform with versatile methods of forming communities and disseminating medical information. [17,18] Chandawarkar et al., and Chartier et al., studies have shown that the Instagram became popular among plastic surgeons due to its engagement with visual images and videos. [19,20] YouTube was also popular in our study and the most used platform for surgical education (77.3%). This finding was echoed by Rapp et al., study, where 86% of video users turned to YouTube to prepare for surgical procedures, and in the study by Mota et al., the residents used YouTube significantly more than specialists. [21,22] Similar results were observed in our study.

Like other studies by Lima et al., and Wagner et al., this study also observes digital media is helpful for surgical learning (91% strongly agreed and 8.5% agreed with a doubt) and majority of respondents believed that digital media is helping to improve surgical skills (67.5% strongly agreed and 24% agreed with doubt) and learning surgery fast. Interestingly majority were taking help of digital media for handling their difficult cases (45% strongly agreed and 26% agreed with doubt). [5,8]

A review article by Keller et al., cited certain risks and drawbacks of digital media use in surgical learning like lack of rigorous peer review affected evidence-based management and privacy concerns. [23] In this study many respondents believed that digital media is a “double edged sword” (66% strongly agreed and 25.5% agreed with doubt) and as majority believed on its advantages, many were aware of its drawbacks also. Many of the loopholes can be addressed by ensuring appropriate patient and institutional permissions, maintaining confidentiality and personal accountability, by declaring conflicts of interests.

Evidence based practice is an important question being asked when role of digital media is considered for learning surgery. It is a personal responsibility of users to carefully evaluate about who is providing the information and the quality of the content. Recommendations for care should be approached with an appropriate measure of skepticism, an analysis of the quality of evidence behind the recommendations, and an appreciation of potential biases and errors. [5]

Crawshaw et al., conducted a randomized controlled trial among 54 residents for teaching the laparoscopic cholecystectomy techniques using standard preparation (group A) and standard preparation plus narrated instructional video of 18 minutes (group B) and the resident performance was assessed by global assessment scale and it was found that residents in the video group scored significantly higher in total score ( $p < 0.002$ ) and overall performance score ( $p < 0.001$ ). [24]

Stain et al., conducted a randomized controlled trial among 110 clerkship students for general surgery (orthopedics, urology, ophthalmology, otolaryngology, neurosurgery, plastic surgery), where two groups were formed and group A was given video conference lectures (6 hours/4week) and group B was given the conventional lectures and they were assessed via quiz and it was found that there were no significant differences in the mean scores of the individual quizzes or between the totals ( $p > 0.05$ ). [25]

Also, Prinz et al., conducted a randomized controlled trial among 172 medical students where the cataract and glaucoma surgery techniques were taught using 3D animations and video sequences (group A) and only the surgical videos (approximately 10 minute for 2 procedures). They were using a multiple choice test of 19 questions and there were significant differences in topographical

understanding ( $p < 0.0001$ ) and in theoretical understanding ( $p < 0.003$ ) in the 3D group compared with the only video group. [26]

Majority of respondents believed in importance of evidence based surgical practice (88% strongly agreed), however most of the respondents believed digital media may or may not affect evidence based medicine (66.5%), followed by respondent believing it has positive impact on evidence based surgery (26.5%) while only few believed that digital media has negative impact on the same (7%).

Though digital media use for surgical education has gained popularity in recent past but it should be considered in its infant state. Still digital media has promising future in surgical education and also for professional development. [5,8,23]

Most of the respondents in this study believed that digital media is not better than the conventional way of learning and will not be able to replace the same in near future. It shows that, still, more efforts are required to gain the trust of the trainees to make digital media as main learning tool. [27]

### Conclusion

Digital media is a potential tool for surgical education. It helps trainees to learn surgery fast with contents especially VLOGS, video lectures and live surgery videos being more helpful for this purpose. However, there are certain limitations to its use in surgical education like privacy, confidentiality and certain misleading information in shared contents. In this digital era, digital media access is easy and may attract surgical fraternities for learning, teaching purpose and in their professional development. Still digital media has not yet gained trust of this fraternity to become main learning tool and is continuing to serve as a complementary tool in surgical learning.

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