

Improving Surgical Techniques: Use of Surgical Procedures Videos as Learning Tools - A Multicentric Study

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ABSTRACT

Objective: To assess utilization of online surgical videos among general surgery residents and consultants.

Study Design: Prospective longitudinal study.

Place and Duration of Study: Twelve Teaching Hospitals, from across Pakistan, from Jan to Jun 2022.

Methodology: Structured questionnaire was formulated after literature review/discussions and was vetted by experts. After pilot study it was distributed to 60 surgery residents and consultants, who were actively involved in patient care, out of which 45 participated in the study (35 residents and 10 consultants).

Results: Surgical videos were utilized by 33 residents (94%) and 10 consultants (100%) for learning purpose ($p=0.439$). YouTube was the most common source (42 participants, 97.7%). Parameters for finding desired videos included relevance to search query (27 participants, 62.8%), length (16 participants, 37.2%) and resolution (15 participants, 34.9%), which actually have little role in determining quality. Moreover, 19 participants (44.2%) did not look for peer reviewed videos ($p=0.673$).

Conclusion: Although surgical videos have become useful adjunct to learning general surgery, care must be taken regarding unregularized, non-standardized content. High quality, peer reviewed content should be sought.

Keywords: Medical education, Surgery, Video-based learning.

How to Cite This Article: Malik AH, Ali S, Anwar SF. Improving Surgical Techniques: Use of Surgical Procedures Videos as Learning Tools - A Multicentric Study. *Pak Armed Forces Med J* 2024; 74(4): 1110-1113. DOI: <https://doi.org/10.51253/pafmj.v74i4.9082>

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INTRODUCTION

Surgery is an ever-growing field, with new procedures being developed and innovations being made all the time. Similarly, knowledge present online has undergone exponential growth over the last decade. An important aspect of valuable content online is the presence of videos, a type of multimedia platform, enabling learning by audio and visual means.¹ Surgery is usually learnt by apprenticeship method,² by observing seniors and getting to know how to perform different procedures, as well as variations and troubleshooting when things go wrong.^{1,3} With explosive growth in the presence of surgical procedures videos online, use of these has become common for knowledge and skill acquisition and refreshing knowledge.^{2,4}

The availability of high-resolution videos making tools and easy access to internet and online resources right from palm have provided new educational opportunities. Performing meticulous surgery is a complex process, with steep learning curve, in which quality of surgery and safety of patients is of paramount importance.⁵ Various studies have proven enhanced surgical performance by surgeons after

watching surgery procedures videos, with reduced complications rates.⁶ Video based learning has the advantage of global learning, combining and analyzing techniques from leaders around the world and interaction between experts. Although video-based learning is gaining popularity, it has been observed that while searching for surgical videos for learning purposes, less attention is often paid to the source, quality of content and peer review; preference being given generally to ease of access.^{7,8} No structured guidelines are available regarding video based surgical learning. We endeavor to explore and compare utilization of online surgical procedures videos by surgical residents and consultants for enhancing learning and understand their assessment regarding quality and importance of surgical videos.

METHODOLOGY

The prospective longitudinal study was carried out, at Twelve Teaching Hospitals of Pakistan, from January 2022 to June 2022. The hospitals included in the study were Combined Military Hospitals (CMH) of Malir (Karachi), Lahore, Rawalpindi, Peshawar, Okara, PNS Shifa (Karachi), Patel Hospital (Karachi), Lyari General Hospital (Karachi), PNS Shifa (Karachi), Jinnah postgraduate Medical Centre (Karachi), Baqai (Karachi), and Pak Emirate Military Hospital (PEMH), Rawalpindi. Ethical Review Committee approval was

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Received: 24 Jul 2022; revision received: 02 Dec 2022; accepted: 07 Dec 2022

soughed (ERC/2022/General Surgery/20). Using WHO Sample Size Calculator, with anticipated population proportion of surgeons utilizing online video resources for learning 0.91, sample size was calculated.

Inclusion Criteria: General surgery consultants and residents of either gender, aged between 20-60 years, actively performing/assisting surgeries at tertiary care hospitals were included.

Exclusion Criteria: Consultants and residents without basic knowledge of online video resources were excluded.

The premade questionnaire was distributed to 60 residents and consultants, selected by non-probability convenient sampling. The participants were categorized depending on training level. Confidentiality of data obtained was maintained. Informed consent was taken beforehand. Data was collected using Google Forms distributed online to participants.

Data was analyzed through Statistical Package for Social Sciences (SPSS) version 23. Mean and standard deviation for numerical data, like age, was calculated. Frequency percentages for categorical data were obtained. Responses of consultants and residents were compared using Chi-Square test. The *p*-value of 0.05 or less was taken as significant.

RESULTS

Responses were obtained from 45 participants (75%). Participants included 10 consultants (22.22%) and 35 residents (77.78%). Mean age of participants was 32.29±6.493 years. Thirty-four participants (75.6%) were male, while 11(24.4%) were female. Different hospitals included were PNS Shifa (15 participants, 33.3%), CMH Rawalpindi (14 participants, 31.1%), CMH Peshawar (5 participants, 11.1%), CMH Lahore (2 participants, 4.4%), JPMC (2 participants, 4.4%), CMH Malir (1 participant, 2.2%), PEMH (1 participant, 2.2%), CMH Okara (1 participant, 2.2%), CMH Kohat (1 participant, 2.2%), Baqai Medical Hospital (1 participant, 2.2%), Patel Hospital (1 participant, 2.2%) and Lyari General Hospital (1 participant, 2.2%). A total of 10 participants (22.22%) were consultants, 12 participants (26.7%) were first year residents, 13 participants (28.9%) were second year residents, 5 participants (11.1%) were third year residents and 5 participants (11.1%) were fourth year residents.

Forty-three participants (95.6%) watched surgical videos for learning purpose (33 residents (94%) and 10 consultants (100%), *p*=0.439). The two participants who did not watch surgical videos were both residents (years 2 and 4). The reason for not watching surgical videos by one of them was “We do not have good quality surgery videos”. Out of the 43 participants who watched surgical videos, comparison between consultants’ and residents’ responses is depicted in Table.

Table: Comparison between Consultants’ and Residents’ Responses (n=45)

Characteristics	Study Groups		<i>p</i> -value
	Residents (n=33) n(%)	Consultants (n=10), n(%)	
Frequency of Watching Videos			
Daily	6(18.2%)	0(0%)	0.299
Weekly	20(60.6%)	7(70%)	
Monthly	5(15.2%)	1(10%)	
No pattern	2(6.1%)	2(20%)	
Type of Procedures watched			
Open	15(45.5%)	0(0%)	0.009
Laparoscopic	0(0%)	1(10%)	
Both	18(54.5%)	9(90%)	
Time of watching surgical videos			
Before surgery	27(81.8%)	9(90%)	0.305
After surgery	1(3.03%)	1(10%)	
No in relation to surgery	5(15.15%)	0(0%)	
Percentage of Preparation time spent in watching surgical videos			
0-25%	26(78.8%)	4(40%)	0.006
25-50%	4(12.1%)	6(60%)	
50-75%	3(9.1%)	0(0%)	
Length of videos			
5 min or less	5(15.2%)	1(10%)	0.477
5-10 mins	11(33.3%)	1(10%)	
10-15 mins	8(24.2%)	5(50%)	
>15 mins	2(6.1%)	1(10%)	
Length does not matter	7(21.2%)	2(20%)	

Colorectal surgeries were watched by most participants (31 participants, 72.1%), followed by hepatobiliary (29 participants, 67.4%) and breast surgery videos (22 participants, 51.2%). Most of the participants preferred watching surgical videos while preparing for performing surgery (31 participant, 72.1%) followed by reading operative books and atlases (25 participants, 58.1%) and discussion with peers (17 participants, 39.5%).

YouTube was the most common source of videos employed (42 participants, 97.7%). Other sources included society pages (Royal College, ACS, CPSP) (6

participants, 14%), MedTube (4 participants, 9.3%), WebSurg (4 participants, 9.3%), OR live (2 participants, 4.7%) and Medline plus (1 participant, 2.3%). However, YouTube was the regarded as the most favorite source by most participants (37 participants, 86%). Most residents and consultants were only aware regarding YouTube for surgery videos. Different parameters for finding relevant videos by participants are depicted in Figure-1. Different key points sought by participants in surgical videos are shown in Figure-2.

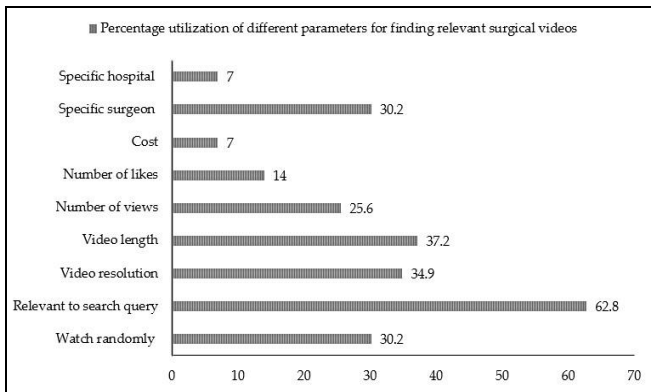


Figure-1: Parameters Used for Searching Relevant Surgical Videos (n=45)

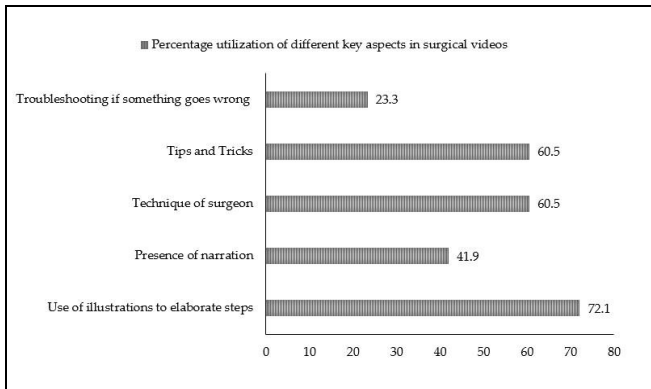


Figure-2: Key Points Sought in Surgical Videos (n=45)

Nineteen participants (44.2%) did not look for peer reviewed videos (5 consultants (50%), 14 residents (42.42%), $p=0.673$).

Perceived benefits of surgical videos were clarification in steps of operations, gaining confidence, mental rehearsal, learning different techniques/tips and tricks, knowing one’s shortcomings, comparison and getting insights from all over the world. Perceived drawbacks included authenticity of videos, increasing trend of lack of reading habits among surgeons and inaccurate assessment of level of difficulty of surgery.

DISCUSSION

The evolution of Web 2.0 has transformed communication along with learning and availability of surgical procedures videos online has revolutionized surgical education as well. With an explosion in available online content, students are now able to watch different procedures, which may not be commonly performed in their setups. This is especially beneficial as surgery cannot be merely learned by reading books.⁶

In accordance to the practice around the world, almost all consultants and residents in our study were utilizing online surgical videos (95.6%). A study done on surgical trainees in United Kingdom demonstrated 86.7% trainees utilized surgical videos for learning, most commonly YouTube and WebSurg.⁷ Most consultants and residents in our study watched videos on weekly basis (60%). Numerous benefits of surgical videos include familiarization with surgical techniques, learning innovative methods and advancements, pursue content from around the world at own pace and ease of access.¹ Both residents and consultants in our study agreed surgical videos were very useful in gaining insight into different surgical procedures, in line with various international studies.⁸⁻¹⁰ In accordance with other studies, most participants watched videos before performing surgeries.¹

YouTube was the primary source of videos in our study. This is in accordance with other studies.¹¹ However lack of peer review in YouTube is a major concern.¹² About half of participants in our study were not familiar with peer reviewed surgical videos. Studies have shown that data across YouTube is lacking comprehensive material.¹³ The videos available on YouTube are often not sufficiently reviewed to provide standard quality.¹⁴ They are ranked based on popularity, views and comments, which are not standardized for educational purposes. Poor techniques or critical safety violations may be present, which may be misleading for novice eye.^{15,16} Therefore, need of peer review cannot be stressed enough.

Although benefits of online videos are numerous, videos on YouTube and other online resources can be published without regulation or content oversight.¹⁷ There always remains potential for the content to be inaccurate. Simple search queries are not able to identify quality or relevance of available videos. Ease of access and cost are other factors which need to be taken into account. That is why YouTube is extremely

popular for learning across the world. The problems with surgical videos available on YouTube may be mitigated by looking for high quality videos by surgical societies and well reputed organizations.¹⁸ Peer review must always be kept in mind and attention paid to the quality of content. Use of authenticated well-structured surgical techniques videos will definitely lead to better learning and better patient care.

CONCLUSION

Although surgical videos have become useful adjunct to learning general surgery, care must be taken regarding unregularized, non-standardized content. High quality, peer reviewed content should be sought instead of opting ease of access.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

AHM & SA: Conception, study design, drafting the manuscript, approval of the final version to be published.

SFA: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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