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" *Impact of YouTube on improving clinical experience among urologists* "

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Abstract

Introduction: One creative way to introduce surgical procedures is through the use of surgical videos in training and instruction. The COVID-19 pandemic restricted face-to-face interactions, required virtual interviews, and prohibited visiting sub-internships. Meanwhile, enhancing our understanding of social media platforms especially YouTube among applicants would be highly useful in future recruitment issues. Many surgeons all over the world uploaded their own surgical techniques, tips and tricks and streaming interactive live discussions from operative theater through YouTube, raising the emerging role of such platform among surgical trainee and expert ones. The aim of the study is to assess the role of YouTube in improving knowledge and surgical skills among urologists in the Middle East.

Method: Through a designed online survey with Checklist, the present study assessed the role of YouTube in improving surgical skills among urologists in the Middle East region. The survey was sent via e-mail and/or social media to urologists among various Middle East countries. Statistical Package for the Social Sciences (SPSS) software was used for descriptive statistics and statistical analysis.

Results: Three hundred sixty-seven urologists accepted the enrollment. The survey average time to be completed was 3 minutes and 40 seconds. Ninety-six residents (26.2%), 139 fellows (37.9%), 121 attending (33%) and 11 unclassified (3%) urologists completed the survey. Sixty three percent (N= 230) urologists were academically affiliated, while 37 % were not (N= 64). Forty nine percent of the candidates did surgeries for the first time by learning from YouTube only (N=181). Out of 27 different surgeries; percutaneous nephrolithotripsy (PCNL), Hypospadias surgery, Urethral stricture repair and Laparoscopic pyeloplasty were among the common surgical procedures done for the first time in 4%, 3%, 3.5%, and 3.5% respectively.

Endourological, Reconstructive procedures and pediatric urology were the common subspecialties urologists found that YouTube was more useful in improving their skills by 45%, 18% and 11% respectively.

In already well mastered surgical procedures, 81% urologist agreed that YouTube improved there surgical handling and expertise. PCNL, URS, TURP and Laparoscopic pyeloplasty were among these procedures in 17.7%, 5.7%, 4%, and 5% respectively among different 25 surgeries.

Conclusion: Many online platforms are available offering proper opportunity for interactive master class for surgical training**.** The readily accessibility of YouTube platform provides a favorable tool for educational content. Many urologists agreed that YouTube is a valuable tool to improve their surgical skills and acquiring new surgical

techniques. Endourologic procedures especially PCNL, hypospadius surgery, urethral stricture repair and laparoscopic pyeloplasty were the most common procedures learned among through you tube, accordingly you tube could be recommended to improve urologists surgical skills in such procedures.

Keyword: YouTube, Urology, Endourology, laparoscopic surgery, Pediatric urology, online education.

Introduction

The use of surgical videos in education and training is an innovative means to teach and expose learners to surgical procedures. Many online platforms are available offering proper opportunity for interactive master class for surgical training [1]. The readily accessibility of YouTube platform provides a favorable tool for educational content [2] .

The COVID-19 pandemic restricted face-to-face interactions, required virtual interviews, and prohibited visiting sub-internships. Meanwhile, improving our understanding of social media specially YouTube among applicants would be highly useful in future recruitment efforts [3].

Many surgeons all over the world uploaded their own surgical techniques, tips and tricks and streaming interactive live discussions form operative theater through YouTube, rising the emerging role of such platform among surgical trainee and also expert ones [4].

In Our survey we are aiming to assess the role of YouTube in urologic knowledge and surgical practice precision among urologists across Middle East.

Methodology

We designed an online survey with checklist to assess the role of YouTube in surgical practice in various fields of urology and if urologists had performed any surgical, endoscopic or laparoscopic maneuver for the first time depending on YouTube acquired knowledge and experience only and if happened; what were these maneuvers and what were the results. And this survey was sent via e-mail and/or social media to urologists among various Middle East countries (image 1).

Image 1 On-line Questionnaire

On-line Questionnaire

1) What is your scientific degree Resident Fellow Attending

2) Are you in academic degree Yes No

3) Did you do any kind of surgeries for the first time by learning from YouTube only

Yes No

4) If your answer is yes, please mention it or them

5) Which sub-specialty you found that YouTube was more useful in improving your skills in it?

We categorized the urologists into four groups, the first group (Attending) who is a consultant, the second group (Fellow) who is a specialist while the last two groups were Resident and Others.

A minimal total sample size is (341) physicians to get a 50% agreement of the extent of utilization and perceived effectiveness of YouTube videos. Using a significance level of 0.05 and confidence interval of 95%

Statistical Package for the Social Sciences (SPSS) software was used for descriptive statistics and statistical analysis. For quantitative data we used student T- test or Mann-Whitney *U* test, while Chi-square was used for qualitative data.

Sample size calculation

One proportion of power analysis of a questionnaire

r	N	E	Z
50%	3000	0.05	1.96

Where:

N: number of people in the population (population size).

E: the desired precision (margin error).

Z: the critical value of required confidence level (95%).

r: the response rate of the audience in the population which is given the questionnaire to fill.

Equation used:

$$x = Z(^{c}/_{100})^{2} r(100\text{-}r)$$

$$n = {}^{N\,x}/_{((N\text{-}1)E^{2} + x)}$$

Where:

n: is the required sample size

$Z(c/100)$ is the critical value for the confidence level.

Summary statement:

A minimal total sample size is **(341) physicians** to get a 50% agreement of the extent of utilization and perceived effectiveness of YouTube videos.

Using a significance level of 0.05 and confidence interval of 95%.

(using Raosoftware for sample size calculation)

Results

Three hundred sixty-seven urologists accepted the survey enrollment. The survey average time to be completed was 3 minutes and 40 seconds. Ninety-six residents (26.2%), 139 fellows (37.9%), 121 attending (33%) and 11 unclassified (3%) urologists completed the survey.

Sixty three percent (N= 230) urologists were academically affiliated, while 37 % were not (N=137). Forty nine percent of the candidates did surgeries for the first time by learning from YouTube (N=181). In already well mastered surgical procedures, 81% of urologists agreed that YouTube improved their surgical handling and experience which was statistically highly significant as shown in table (1).

Table (1) Participants demographics and their response.

Total number	**367**			
Degree	***Resident***	***Fellow***	***Attendants***	***Others***
	96 (26.1%)	139(37.9%)	121(33%)	11(3%)
Affiliation	***Academic***		***Non-Academic***	
	230 (62.6%)		137 (37.4%)	
Doing surgery for first time	***Yes***		***NO***	
	181 (49%)		186 (51%)	
P value 0.022				
YouTube Improves Surgical Technique	***Yes***		***No***	***No answer***
	296 (80.7%)		66 (18%)	5 (1.3%)
P value 0.000				

Out of 27 different surgeries; PCNL, Hypospadias surgery, Urethral stricture repair and Laparoscopic pyeloplasty were among the common surgical procedures done for the first time in 4%, 3%, 3.5%, and 3.5% respectively figure (1).

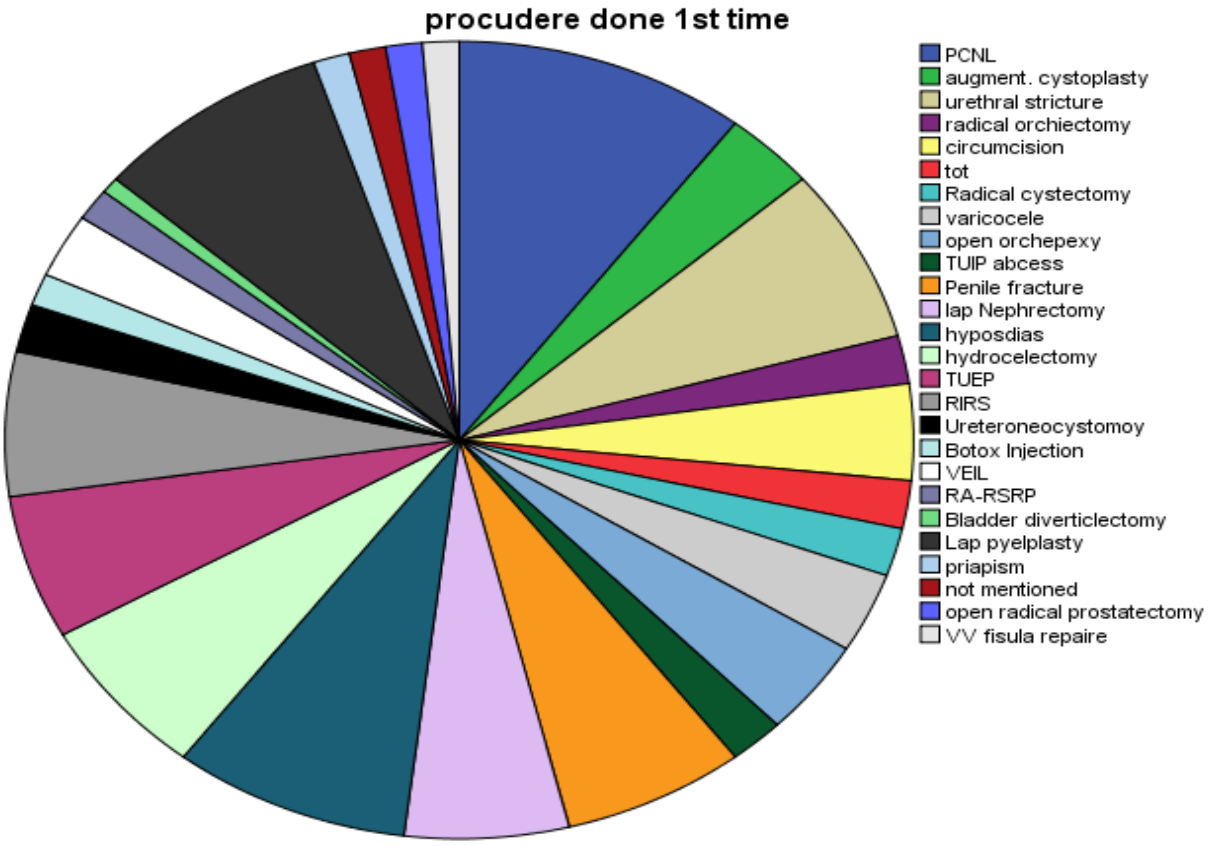

Figure (1) various procedures learnt from YouTube for the first time.

Endourological, Reconstructive procedures and pediatric urology were the common subspecialties urologists found that YouTube was more useful in improving their skills by 45%, 18% and 11% respectively as shown in figure (2).

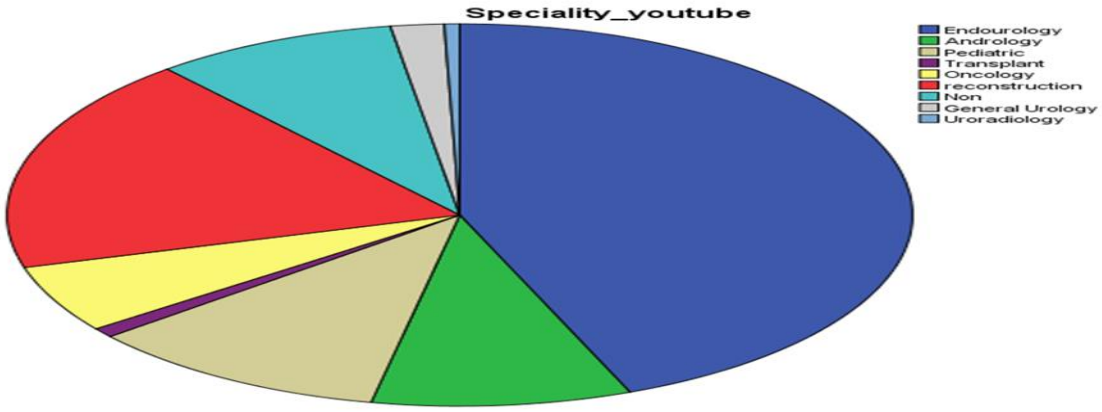

Figure (2) Specialty skills improved by YouTube.

Table (2) Detailed specialty skills improved by YouTube.

		Speciality skills improved by YouTube									Total
		Endourology	Andrology	Pediatric	Transplant	Oncology	reconstruction	Non	General Urology	Uroradiology	
Degres	Attending	71 58.7%	5 4.1%	5 4.1%	0 0.0%	11 9.1%	16 13.2%	13 10.7%	0 0.0%	0 0.0%	121
	Fellow	54 38.8%	12 8.6%	27 19.4%	3 2.2%	4 2.9%	29 20.9%	6 4.3%	2 1.4%	2 1.4%	139
	Resident	33 34.4%	17 17.7%	8 8.3%	0 0.0%	3 3.1%	22 22.9%	8 8.3%	5 5.2%	0 0.0%	96
	other	3 27.3%	0 0.0%	0 0.0%	0 0.0%	3 27.3%	0 0.0%	5 45.5%	0 0.0%	0 0.0%	11
Total		161 43.9%	34 9.3%	40 10.9%	3 0.8%	21 5.7%	67 18.3%	32 8.7%	7 1.9%	2 0.5%	367
P value											0.000

PCNL, URS, TURP and Laparoscopic pyeloplasty were the procedures YouTube helped to improve their technique in 17.7%, 5.7%, 4%, and 5% respectively among different 25 surgeries as shown in figure (3).

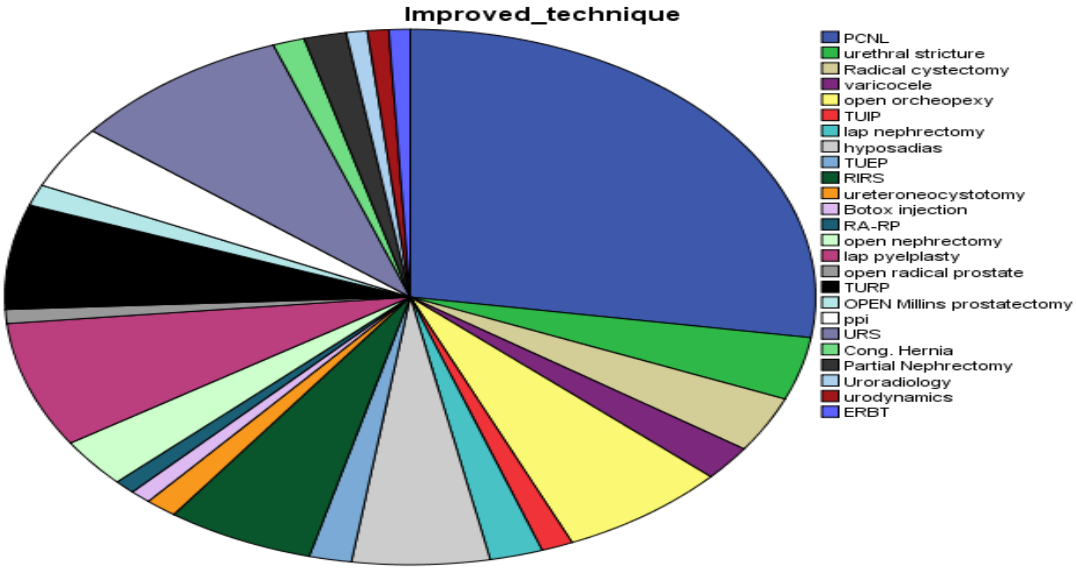

Figure (3) YouTube improved acquired surgical techniques.

Table (3) Detailed improved surgical techniques by YouTube.

		Youtube_improved_technique			Total
		Yes	No	No answer	
Degrees	Attending	106 87.6%	15 12.4%	0 0.0%	121
	Fellow	110 79.1%	29 20.9%	0 0.0%	139
	Resident	71 74.0%	22 22.9%	3 3.1%	96
	Other	9 81.8%	0 0.0%	2 18.2%	11
Total		296 80.7%	66 18.0%	5 1.4%	367 100.0%
P value					0.000

Discussion

Surgical training programs are designed to enhance surgical skills by facilitating the exchange of knowledge between mentors and trainees. Residency and fellowship programs are crucial steps for physicians aspiring to become proficient surgeons. Direct interaction with instructors, hands-on exposure to the surgical field, and continuous mentorship are essential elements for gaining surgical qualifications and ultimately improving healthcare outcomes. However, the COVID-19 pandemic, severely disrupted in-person educational opportunities and limited physical interaction across the globe. Healthcare providers focused on addressing the pandemic, with many hospitals redirecting resources to intensive care units (ICUs). As a result, many elective surgeries were delayed, and only emergency procedures were allowed to take place under strict conditions. Consequently, surgical training opportunities were significantly restricted, limiting hands-on exposure for residents and fellows. Additionally, academic meetings and scientific conferences were either canceled or transitioned to virtual platforms [1].

In response to these challenges, several online platforms began offering live, semi-live, or recorded surgical procedure videos, often featuring high-quality, detailed demonstrations. These platforms quickly gained popularity among surgeons

globally, who began registering to access valuable educational content. Social media platforms, including YouTube, Facebook, and Twitter, also saw a surge in use, particularly among younger surgeons. Many physicians started using these platforms not only to share their surgical techniques but also to learn from peers, exchange insights, and discuss decision-making processes [2, 3 and 4].

In our study, nearly 49% of urologists reported performing surgeries for the first time after learning from YouTube, which aligns with the findings of Andrew A. Daigle, MD, et al., who noted that 60% of surgical residents use YouTube and similar platforms to enhance their learning [5]. Moreover, 81% of urologists in our study indicated that YouTube helped improve their skills in well-established procedures. The most frequently mentioned procedures for improvement included PCNL (17.7%), URS (5.7%), Laparoscopic pyeloplasty (5%), and TURP (4%) This result mirrors the findings of William D. Reedy, MD, et al., who reported that 70-80% of urologists use YouTube to either learn new procedures or refine their existing skills [6].

When examining the most common procedures learned on YouTube, we found that PCNL, hypospadias surgery, urethral stricture repair, and laparoscopic pyeloplasty were the most frequently studied by urologists. Among these, PCNL was the

most common procedure learned (reported by 4% of respondents). This is consistent with research by Michael A. Swartz, MD, et al., which identified PCNL and ureteroscopy (URS) as among the most frequently searched procedures on YouTube for those seeking to master new techniques. Additionally, laparoscopic pyeloplasty has also become a widely studied procedure on YouTube. As the adoption of minimally invasive procedures—including laparoscopic and robotic-assisted techniques—continues to grow, platforms like YouTube offer an increasingly valuable resource for surgeons [7].

Our study also found that YouTube was most beneficial in the subspecialty of endourology (45%), followed by reconstructive surgery (18%) and pediatric urology (11%). These findings align with those of Adam S. S. Miller, MD, et al., who noted that endourology is particularly popular for online learning due to the complex, minimally invasive nature of procedures such as PCNL, URS, and stent placement [8].

Conclusion

Many online platforms are available offering proper opportunity for interactive master class for surgical training**.** The readily accessibility of YouTube platform provides a favorable tool for educational content**.** Many urologists agreed that

YouTube is a valuable tool to improve their surgical skills and acquiring new surgical techniques. Endourologic procedures especially PCNL, hypospadius surgery, urethral stricture repair and laparoscopic pyeloplasty can be recommended for young urologists to get more expertise from YouTube videos according to data collected from our sharing urologists.

While the study demonstrates several strengths, such as the large sample size and clear focus on subspecialties, there are limitations to consider. Self-reporting bias may influence how urologists assess YouTube's impact on their learning, and the wide variety of procedures surveyed calls for a more detailed exploration of the specific procedural aspects most effectively taught via YouTube.

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