The concern about the educational quality of online videos on laparoscopic myomectomy

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SUMMARY

OBJECTIVE: The aim of this study was to analyze the surgical content of the 50 most-viewed laparoscopic myomectomy videos on YouTube while evaluating the educational quality and accuracy of the videos.
METHODS: In this cross-sectional study, the keyword "laparoscopic myomectomy" was searched in publicly available content on YouTube, and the videos were sorted by view count using YouTube's advanced search options. Out of the first 66 videos, only 50 were eligible according to our selection criteria. One associate professor of gynecology and one gynecology resident watched these videos independently and evaluated the quality and surgical aspects. Our primary outcome was the scores of the Quality Criteria for Consumer Health Information and Global Quality Score and the features of the surgical technique.
RESULTS: The 50 most-viewed laparoscopic myomectomy videos were uploaded between 2010 and 2021. They had a mean of 66636.6±103772.2 views. According to the Quality Criteria for Consumer Health Information criteria, 78% of the videos were categorized as "poor," 12% of them were "fair," and 10% of them were "very poor." The indication of the surgery was not specified in 27 (54%) of them. The surgeons in 39 (79.6%) of the videos did not use any containment system for the power morcellation, even though it was restricted by the United States Food and Drug Administration. The preoperative and perioperative precautions to minimize blood loss were underemphasized. There was no scientific evidence in 49 (98%) of the videos.
CONCLUSION: Laparoscopic myomectomy videos on YouTube are limited in terms of providing evidence-based and well-organized scientific knowledge.
KEYWORDS: Webcast. Laparoscopy. Uterine myomectomy. Education.

INTRODUCTION

Social media has emerged as an important source of health care-related information for physicians and patients[1]. Among the web-based resources, YouTube, an open-access video-sharing website, is among the three most popular websites, with more than 4 billion videos viewed daily and more than 500 h of video content uploaded every minute[2]. However, the lack of peer review and unconditional acceptance of videos without any elimination process led to inaccurate and misleading information accumulating on YouTube[3].

Uterine fibroid is the most common benign disorder of female genital tract with an estimated incidence of 20–40% in reproductive age[4]. Although the incidence of myomas has been increasing due to the inverse association between myoma risk and parity, approximately one-quarter of women seek treatment due to myoma-related symptoms[5]. Surgical management remains the main therapeutic option. In the last decade, as the minimally invasive approach became more popular, the number of laparoscopic myomectomy procedures has increased until the US Food and Drug Administration (USFDA) issued a statement against laparoscopic power morcellation for myomectomy or hysterectomy without the tissue containment system[6]. Nevertheless, the minimally invasive procedures are associated with better reproductive outcomes and lower perioperative morbidity in suitable patients[7].

The significant increase in the number of laparoscopic myomectomy procedures and the interest of young physicians prompted the sharing of videos. However, the surgical technique and the educational quality of them are disputable. For this reason, we analyzed the 50 most-viewed laparoscopic myomectomy videos on YouTube and described the surgical content of them while evaluating the educational quality and accuracy of the videos using the Quality Criteria for Consumer Health Information (DISCERN) and Global Quality Score (GQS) scales.

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METHODS

Study design

The STROBE guideline was followed. For this observational study, a search was made in publicly available content on YouTube (http://www.youtube.com) by the keyword "laparoscopic myomectomy" on November 15, 2021, and the videos were sorted by the view count using YouTube's advanced search options. The first 66 videos, which are in English, were saved to a playlist. One associate professor of gynecology and one gynecology resident watched these videos independently between November 15, 2021, and November 24, 2021. The inclusion criteria were as follows: (1) narration in English; (2) primary content related to laparoscopic myomectomy; and (3) acceptable audio-visual quality. The exclusion criteria were as follows: (1) narration in languages other than English; (2) poor audio-visual quality; (3) duplicate videos; (4) patient experience videos; and (5) robotic surgery videos. We had no limit on the video length.

Video evaluation process

The following characteristics for each video were noted: upload date, total number of views, total video length in seconds, time passed since upload date, viewer interest parameters such as number of likes, dislikes, and comments, the channel type and the number of subscribers of the channel, the type of content, and the type of visual content and the narrator in the video.

The aspects of surgical technique were recorded as follows: number of layers in wound closure; specimen removal technique; indication of myomectomy; suture material; energy modality of surgical device; number of trocars used; size of the largest myoma; number, type, and position of the fibroid; suturing method; trocar used for suturing; type of serosa incision; usage of uterine manipulator; entrance to the endometrial cavity; duration of operation; presence of scientific evidence; postoperative complications; amount of blood loss; rate of blood transfusion; postoperative discharge day; preoperative management; pathology; any method for adhesion prevention; and the vasopressin injection into the myometrium.

Quality assessment

There is no established standard for evaluating the quality of online surgical videos. We preferred using the DISCERN[8] and GQS scales[9], both of which were used by previous studies to evaluate the quality and reliability of the Internet content. The DISCERN questionnaire has 3 sections with 16 questions and is presented in Supplementary Table 1. Each question has a 5-point scale from no to yes. DISCERN points were categorized as very poor: <27, poor: 27–<39, fair: 39–<51, good: 51–<63, and excellent: 63–75. GQS is a 5-point scale scoring system (Supplementary Table 2)[9]. Also, the scientific evidence was recorded as present or absent[10].

Outcome measures

The primary outcome measures are the DISCERN and GQS scores of the videos and the remarkable features of the surgical technique. Our secondary outcome was the incompatibility between the scores of associate professor and resident.

Ethical implications

As this study does not constitute human participants, ethical approval was waived in accordance with the Institutional Review Board of Istanbul University-Cerrahpaşa, Turkey. The study was conducted in accordance with the Declaration of Helsinki and followed the ethical standards of Turkey.

Statistical analysis

The data were analyzed by Statistical Package for Social Sciences (SPSS) 20.0 version. The descriptive statistics were presented as number, percentage, standard deviation, median, minimum and maximum. To assess the popularity of the video, the video power index (VPI) was calculated as [(number of likes/number of likes+number of dislikes)´100]. So, the VPI value was out of 100. The number of views per day for each video was calculated by the formula: [total number of views on the day of viewing/(day of viewing-upload date of the video (days)].

The mean of the DISCERN and GQS scores of both researchers was calculated by the formulas: [DISCERN score of the 1st researcher+DISCERN score of the 2nd researcher)/2] and [GQS score of the 1st researcher+GQS score of the 2nd researcher)/2] for each video. For the evaluation of the correlation between the DISCERN and GQS scores of two researchers, after the data were found to be normally distributed, the Spearmen correlation analysis was used. The level of correlation was assumed as follows: low: the correlation coefficient between 0.10 and 0.29; moderate: the correlation coefficient between 0.30 and 0.49; and high: the correlation coefficient >0.50[11]. The compliance between the researchers was assessed by the Krippendorff alpha (α) value. α>0.80 showed high compliance, α between 0.67 and 0.80 showed moderate compliance, and α<0.67 showed low compliance[12]. The data were evaluated in terms of normality of distribution and parametric tests. Student's t-test and nonparametric Mann-Whitney U tests were used accordingly. $p<0.05$ was accepted as statistically significant.

Table 1. Descriptive characteristics of videos and the aspects of surgical technique.

Variables	n (%)	Variables	n (%)	Variables	n (%)
Channel types	49	The number of fibroid	50	The entrance to the endometrial cavity	49
Physician	39 (79.6)	One	35 (70.0)	No	43 (87.8)
Educational channel	5 (10.2)	Two	7 (14.0)	Yes	6 (12.2)
Medical device firm	1 (2.0)	Three	4 (8.0)	The duration of operation (min)	50
Hospital channel	4 (8.2)	Four	2 (4.0)	Unknown	48 (96.0)
The narrator	50	Five	2 (4.0)	Ninety	1 (2.0)
Physician	44 (88.0)	The type of fibroid	50	Three hundred and sixty	1 (2.0)
Others	6 (12.0)	Intramural	32 (64.0)	Scientific evidence	50
The type of visual content	50	Subserosal	10 (20.0)	Absent	49 (98.0)
Real image	47 (94.0)	Submucosal	1 (2.0)	Present	1 (2.0)
Real image and animation	3 (6.0)	Other	7 (14.0)	Postoperative complications	50
The layers in wound closure	48	The position of fibroid	50	Not specified	48 (96.0)
Single	14 (29.2)	Fundus	21 (42.0)	None	2 (4.0)
Double	21 (43.8)	Posterior	19 (38.0)	Vasopressin injection into myometrium	50
Triple	9 (18.8)	Anterior	8 (16.0)	Yes	34 (68.0)
Quadruple	4 (8.2)	Cervix	1 (2.0)	No	16 (32.0)
Specimen removal technique	49	Other	1 (2.0)	The amount of blood loss (mL)	50
Morcellation without any containment system	39 (79.6)	The technique of myometrial suturing	48	Not specified	48 (96.0)
Morcellation with containment system	3 (6.2)	Continuous non-locking	22 (45.8)	25	1 (2.0)
Removing by mini-laparotomy	1 (2.0)	Single	20 (41.7)	100	1 (2.0)
Not specified	6 (12.2)	Continuous locking	5 (10.4)	The blood transfusion	50
Indication of myomectomy	50	Baseball	1 (2.1)	Not specified	49 (98.0)
Not specified	27 (54.0)	The technique of serosal suturing	48	No	1 (2.0)
Specified	23 (46.0)	Continuous nonlocking	23 (47.9)	Postoperative discharge day	50
The suture material	48	Single	13 (27.1)	Not specified	47 (94.0)
Polyglactin 910	34 (70.8)	Continuous locking	9 (18.8)	The night of surgery	2 (4.0)
Polyglecaprone 25	2 (4.2)	Baseball	3 (6.2)	The first postoperative day	1 (2.0)
V-loc[a]	12 (25.0)	The trocar used for suturing	50	Preoperative management	50
The energy modality of surgical device	49	Ipsilateral	30 (60.0)	Not specified	48 (96.0)
Unipolar	8 (16.4)	Contralateral	20 (40.0)	No	1 (2.0)
Bipolar	1 (2.0)	The type of serosal incision	50	GnRH analog	1 (2.0)
Sinusoidal	29 (59.3)	Horizontal	24 (48.0)	Pathology	50
No energy modality, only scissors	7 (14.3)	Vertical	20 (40.0)	Not specified	49 (98.0)
Sinusoidal and vessel sealing	2 (4.0)	Oblique	6 (12.0)	Benign	1 (2.0)
Bipolar spatula	1 (2.0)	The usage of uterine manipulator	50	Any method for adhesion prevention	49
Not specified	1 (2.0)	Use of LMFI[b], manipulator unknown	26 (52.0)	No	40 (81.6)
The number of the trocars	50	No	9 (18.0)	Yes	9 (18.4)
Three	12 (24.0)	Use of only LMFI[b]	8 (16.0)		
Four	37 (74.0)	Yes	7 (14.0)		
Five	1 (2.0)				

[a]V-loc: barbed absorbable wound device. [b]LMFI: laparoscopic myoma fixation instrument with screw-shaped tip.

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Table 2. The Quality Criteria for Consumer Health Information and Global Quality Scores in terms of the researcher degree and the descriptive statistics of the videos in terms of the narrator type.

DISCERN scores (resident)		DISCERN scores (associate professor)			
mean±SD	Median (min–max)	mean±SD	Median (min–max)	r[f], p	Krippendorff α
33.5±6.8	32.5 (16.0–50.0)	32.1±3.8	34.0 (26.0–38.0)	0.441, 0.001	0.475
GQS scores (resident)		**GQS scores (associate professor)**			
mean±SD	Median (min–max)	mean±SD	Median (min–max)	r[f], p	Krippendorff α
3.2±0.9	3.0 (1.0–5.0)	2.5±1.1	3.0 (1.0–4.0)	0.468, 0.001	0.280

Narrator of the video	DISCERN scores[a]		DISCERN categories[b]	n (%)	p[d]
	mean±SD	Median (min–max)			
Physician (n:44)	32.7±4.5	33.0 (22.0–42.5)	Very poor (<27)	4 (9.1)	0.719
			Poor (27–<39)	35 (79.5)	
			Fair (39–<51)	5 (11.4)	
			Very poor (<27)	1 (16.7)	
Others (n:6)	33.4±5.8	32.8 (26.5–43.5)	Poor (27–<39)	4 (66.6)	
			Fair (39–<51)	1 (16.7)	

	GQS scores[c]			
	mean±SD	Median (min–max)	p[e]	
Physician (n:44)	2.8±0.8	3.0 (1.0–4.0)	0.354	
Others (n:6)	3.2±1.0	3.5 (2.0–4.5)		

	Video Power Index (VPI)			
	mean±SD	Median (min–max)	p[e]	
Physician (n:44)	87.7±10.0	90.5 (48.7–98.8)	0.238	
Others (n:6)	67.5±37.6	85.3 (0.0–94.9)		

	The number of views per day			
	mean±SD	Median (min–max)	p[e]	
Physician (n:44)	45.2±85.5	14.5 (2.5–505.7)	0.765	
Others (n:6)	35.9±46.7	21.5 (2.7–127.9)		

DISCERN: Quality Criteria for Consumer Health Information; GQS: global quality scale; SD: standard deviation; min: minimum; max: maximum; %: the percentage in the group of narrator. [a]The mean DISCERN scores of the researchers were calculated by taking the average of the DISCERN scores of the two researchers. [b]Each video was included in the relevant DISCERN category according to the DISCERN scores of the researchers. [c]The mean GQS scores of the researchers were calculated by taking the average of the GQS scores of the two researchers. [d]The significance test measures the difference between the means of two groups. [e]Mann-Whitney U test. [f]Spearman r correlation coefficient.

RESULTS

The 50 most-viewed laparoscopic myomectomy videos were uploaded between 2010 and 2021. They had a mean of 66636.6±103772.2 views. The videos were uploaded mostly by the physicians (79.6%), and the narrator was a physician in 44 (88.0%) of them. The videos are real surgical videos in 47 (94%) of the cases. In 28 (38%) of the videos, there was no explanation during the video play. The video with the highest view rate (624996 times) was uploaded by a physician from India in 2018. It has also received the maximum number of likes (2200 likes). In that video, a laparoscopic myomectomy was done on a 6 cm intramural myoma located at the anterior wall of the uterus, and the myoma was removed by power morcellation without any containment system. The indication of the surgery was not specified in 27 (54%) of them. The myomectomy procedure consisted of singles in 35 (70%) and intramural myoma in 32 of them (64%). The myomas were located at the fundus of the uterus in 21 (42%) of them. Double-layered wound closure was performed in 21 (43.8%) of the videos. Polyglactin 910 was the preferred suture material in 34 (70.8%) of them. A continuous nonlocking pattern was the technique used in the myometrial suturing of 22 videos (45.8%). There was no scientific evidence in 49 (98%) of the videos. The postoperative complications, amount of

blood loss, blood transfusion rate, and pathology were not specified in 48 (96%), 48 (96%), 49 (98%), and 49 (98%) of the videos, respectively. The rest of the descriptive characteristics of the videos and the aspects of surgical technique are shown in Table 1.

Our two researchers had moderate correlation (r: 0.441, p: 0.001; r: 0.468, and p: 0.001) and low-level compliance (Krippendorff α: 0.475 and Krippendorff α: 0.280) in terms of DISCERN and GQS scores, respectively (Table 2). The mean DISCERN score of all videos was 32.8±4.6 (median: 33.0 and min–max: 22.0–43.5), and the mean GQS score was 2.9±0.9 (mean: 3.0 and min–max: 1.0–4.5). The mean of DISCERN and GQS scores of the videos uploaded by 5 educational channels were 34.2±6.0 (median: 34.0 and min–max: 28.5–43.5) and 3.1±1.1 (median: 3.5 and min–max: 2.0–4.5), respectively. VPI points were calculated as 85.3±16.6 (median: 90.5 and min–max: 0.0–98.8) out of 100.
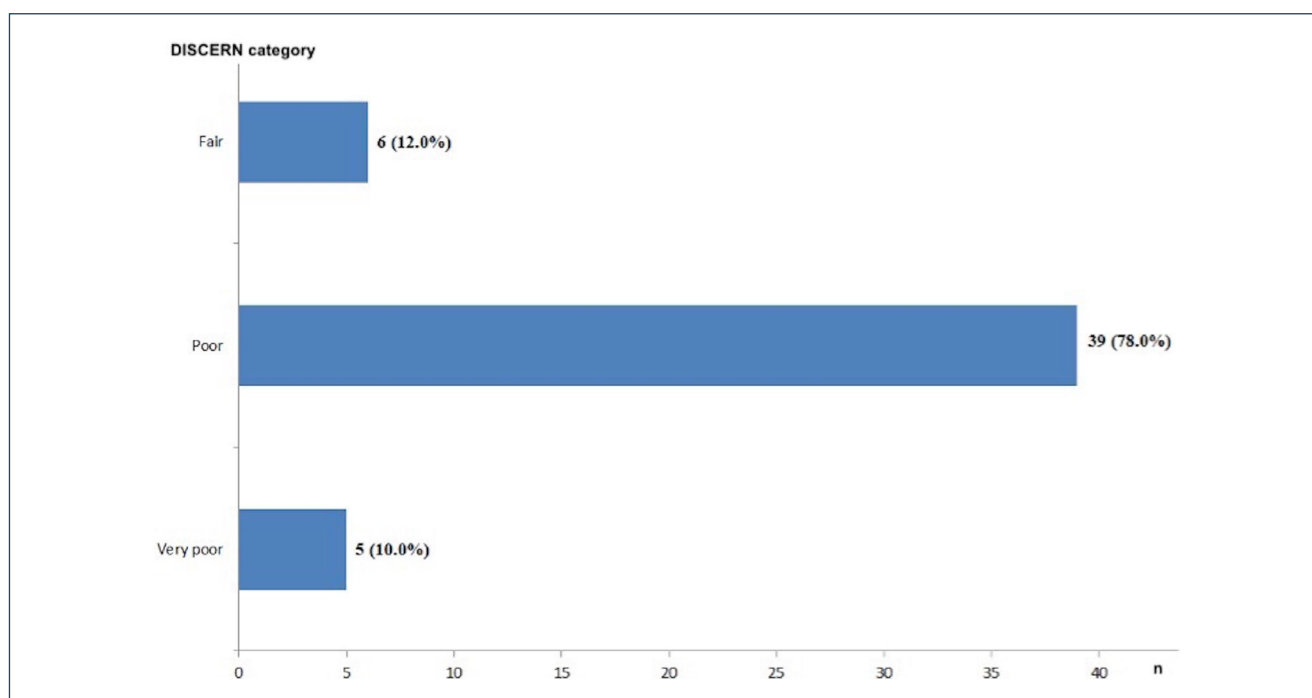
According to the DISCERN criteria, 78% of the videos were categorized as "poor," while 12% of them were "fair" and 10% of them were "very poor," as shown in Figure 1. There was not any statistically significant difference in DISCERN scores, according to the narrator of the video (p=0.719). Among the videos with narrators who were physicians, 79.5% of them were categorized as "poor," 11.4% of them were "fair," and 9.1% of them were "very poor" (Table 2). While in the group of videos with narrators who were not physicians, 66.6% of the videos were categorized as "poor," 16.7% of them were "fair" and 16.7% of them were "very poor." GQS points, VPI, and the number of views per day were compared, and there was no statistically significant difference between them in terms of narrator type (p>0.05).

DISCUSSION

This study determined the poor quality and reliability of 50 most-viewed laparoscopic myomectomy videos on the most popular video sharing platform, YouTube. The most-viewed laparoscopic myomectomy videos not only lacked scientific evidence but also had generally poor scores according to the DISCERN and GQS scales. Moreover, these scores were moderately correlated between two independent researchers; the associate professor of gynecology gave slightly lower DISCERN and GQS scores to the videos. This emphasizes that the inaccurate content of the videos can be interpreted and filtered by the wisdom of a senior physician, but the junior physicians are at risk of learning nonevidence-based information.

The low educational quality of medical videos on YouTube was shown by many other researchers in other fields[13]. The incompatibility of the laparoscopic myomectomy videos with current surgical guidelines is significantly low. They do not educate the viewer about the patient's history and characteristics, possible treatment options, taking informed consent, preoperative

Figure 1. Categorization of the videos according to the Quality Criteria for Consumer Health Information score.

management, surgical setup, etc. In addition to that, the surgical techniques are controversial. The most important concern was the specimen removal technique after the excision of the myoma: power morcellation[7]. Beginning with its warnings in 2014, the FDA finally restricted the use of power morcellation only with a containment system and with the informed consent of the patient in 2020[6]. Even though 32 of the 50 videos were uploaded after 2014, in 39 (79.6%) of them, the surgeons did not use any containment system for the removal without any referral to FDA restriction. The videos about laparoscopic myomectomy should have at least emphasized the preventive role of the containment system against the intraperitoneal spread of the myometrial cells. Intraoperative vasopressin injection, another technique for decreasing intraoperative blood loss, was also underemphasized[14]. Even though preoperative (correction of anemia and GnRHa usage) and perioperative precautions (vasopressin injection, uterine artery ligation, and using barbed suture) are very important for better surgical outcomes, they were not emphasized[15]. There was also inconsistency between the number of suture layers in the myometrium during the wound closure, which determines the risk of uterine rupture in subsequent pregnancies. According to evidence-based medicine, multilayer closure of myometrium (two layers for myometrium and one layer for serosa, with a continuous nonlocking fashion) is recommended[16]; however, no recommendations were made in the videos. Finally, the indication for myomectomy was not specified in 54% of the videos, as were patient histories, which prevented the viewer from learning the correct indications for myomectomy. In this cross-sectional study, we tried to highlight the importance of three major concerns of laparoscopic myomectomy: (1) the risk of uterine rupture in subsequent pregnancies; (2) the malignancy potential of the myoma; and (3) the appropriate indication for myomectomy.

Our study is limited in terms of the sample size since it only included 50 most-viewed "laparoscopic myomectomy" videos on YouTube. Yet, people tend to watch the most-viewed videos on the most popular video-sharing platform. On the other hand, our study is strong in the way that (1) the quality of the videos was investigated using two different scales (DISCERN and GQS), (2) the scorings were independently done by two raters who have different academic degrees, (3) the correlation between the scores of two different raters was analyzed, (4) the surgical aspects were recorded and discussed according to evidence-based medicine, and (5) the safety concerns of the videos were addressed.

CONCLUSION

Laparoscopic myomectomy videos on YouTube are limited in terms of providing evidence-based, well-organized scientific knowledge. An established guideline is necessary to standardize the laparoscopic myomectomy procedure and to facilitate the practice by reducing the learning curve.

AUTHORS' CONTRIBUTIONS

OK: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. **IBOE:** Conceptualization, Data curation, Formal Analysis, Investigation, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. **EB:** Data curation, Formal Analysis, Investigation, Writing – review & editing.

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