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REVIEW

Educational quality of youtube videos on hypospadias repair: A comparison of institutional *vs.* individual sources

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Summary *Purpose: This study aimed to evaluate the educational quality of hypospadias surgery videos on YouTube using structured tools, and to investigate the relationship between digital popularity metrics and educational value by comparing institutional and individual sources.*
Methods: A YouTube search using the terms "hypospadias surgery" and "hypospadias repair" yielded 96 eligible videos, categorized as institutional (n = 43) or individual (n = 53). Educational quality was independently assessed by three reviewers using the LAP-VEGaS, JAMA, Modified DISCERN, and Global Quality Score (GQS) criteria. Digital popularity metrics, including the Video Power Index (VPI), were calculated, and a multivariable linear regression analysis was performed to identify independent predictors of educational quality.
Results: Institutional videos achieved significantly higher educational quality scores across all structured assessment tools (LAP-VEGaS, JAMA, Modified DISCERN, and GQS) compared to individual videos. Furthermore, institutional videos demonstrated significantly higher views, VPI, and longer durations. Although significant correlations existed between popularity metrics and quality scores, multivariable regression analysis revealed that video duration was the sole independent predictor of the LAP-VEGaS score; channel type and VPI were not independent determinants.
Conclusions: Institutional videos provide superior structured educational quality for hypospadias repair. Digital engagement metrics do not independently predict actual educational value; instead, video duration is the key determinant of quality. Surgical trainees should preferentially utilize detailed, adequately long institutional content over popular, short videos.

KEY WORDS: *Hypospadias; Surgical education; YouTube; Quality control; Online learning.*

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INTRODUCTION

Hypospadias is one of the most common congenital anomalies in males. This condition is typically characterized by a proximal displacement of the urethral opening, penile curvature, and an insufficient, hooded foreskin (1). The goal of hypospadias repair is to restore cosmetic and functional normality, and surgery is currently recommended between 6 and 18 months of age (2). Penile biometric parameters, such as a small glans width and a narrow urethral plate, are among the anatomical factors that increase the risk of postoperative complications and present technical challenges (3). The only treatment for hypospadias is the surgical repair of the anatomical defect (4). The fact that over 300 different surgical procedures have been described in the literature serves as evidence that the treatment has not been perfected or standardized (5). A successful initial repair can be performed in most patients. However, this leads to poor surgical outcomes in a small number of patients. These unfortunate patients may experience physical scarring along with abnormal genital organs resulting from repeated surgeries, as well as difficulty urinating normally (they may have to sit to urinate) and face poor cosmetic results (6).

Today, video-based learning resources have become increasingly important in surgical education. Particularly in surgical procedures that require a high degree of precision and reconstructive expertise, such as hypospadias repair, the ability to visually observe surgical steps in detail serves as an invaluable learning tool for residents and young specialists. YouTube™ is a public video-sharing platform that allows users to watch and upload unlimited video content (7). The ability to demonstrate surgical techniques step by step has made open-access online video platforms like YouTube an indispensable part of preoperative preparation processes (8).

Studies in the literature demonstrate that video-assisted learning makes significant contributions to the acquisition of surgical skills and the understanding of complex procedures (9). However, since content on YouTube can be uploaded by anyone without undergoing any peer review or medical editorial process, the educational quality of videos on the platform varies greatly. Many surgical videos fail to adequately demonstrate critical steps and carry the risk of containing incomplete or non-standardized information (10, 11).

This situation has created a need to evaluate the quality, reliability, and procedural integrity of surgical videos using objective tools. Today, standardized scoring systems such as LAP-VEGaS, JAMA, Modified DISCERN, and the *Global Quality Score* (GQS) are widely used in the literature to assess the educational value of medical videos (12, 13). In addition, digital metrics such as view counts, like rates, and the *Video Power Index* (VPI) are fre-

quently analyzed to assess the visibility of videos in the digital environment and viewer engagement (14).
There is an ongoing debate in the literature regarding whether popularity metrics accurately reflect the actual educational quality of videos. The fact that algorithms typically prioritize viewer engagement over educational accuracy suggests that high view counts do not necessarily equate to high educational quality. On the other hand, it has been reported that videos uploaded by institutional channels – such as universities, hospitals, or professional associations – generally provide much more systematic and high-quality educational content compared to individual uploads (15).
Although various surgical fields have been examined in the literature, there is no comprehensive analysis focusing on the educational quality of hypospadias surgery videos. The aim of this study is to systematically evaluate the educational quality of the 96 videos included in the study – which were searched for on the YouTube platform using the keywords "*hypospadias surgery*" and "*hypospadias repair*" – using objective scoring systems (LAP-VEGaS, JAMA, Modified DISCERN, GQS) under the supervision of three independent evaluators.
Additionally, our study aims to highlight the quality differences between institutional videos and individual uploads and to provide a current perspective to the literature by evaluating the relationship between digital popularity indicators and educational quality.

Materials and methods

Search strategy and data collection

On March 2, 2026, a search was conducted on the YouTube platform using the keywords "*hypospadias surgery*" and "*hypospadias repair*," and a total of 96 videos that met the criteria were included in the study. The user logged out of their account during the search, and default search settings were used. To minimize the impact of algorithmic personalization, the browser history was cleared before conducting the search.

Inclusion and exclusion criteria

The videos obtained from the search were intended to meet specific standards to be included in the study. Accordingly, the criteria for including videos in the study were determined as follows:

- Videos that clearly demonstrate the steps of hypospadias repair performed on humans.
- Videos with titles, descriptions, or content in English.
- Videos of sufficient length (> 1 min) to allow for adequate evaluation of surgical steps and technical details.

To ensure the objectivity of the study and the quality of the dataset, videos with the following characteristics were excluded from the study:

- Duplicate (copy) versions of the same video uploaded by different channels.
- Procedures performed on animal models.
- Videos consisting solely of animations, slides, or theoretical explanations and not containing actual surgical footage.
- Videos containing incomplete or partial surgical footage that do not reflect the entire procedure.
- Videos that focus solely on complication management rather than teaching the surgical technique.
- Videos uploaded by industrial companies or commercial firms for sponsored or promotional purposes.
- Videos that are technically inadequate to the extent that they do not allow for evaluation of image and/or audio quality.

Video evaluation and popularity metrics

The videos were divided into two main groups based on uploader profiles: "*Individual*" (n = 53, 55.2%) and "*Institutional*" (n = 43, 44.8%). Institutional channels were defined as official accounts belonging to universities, academic hospitals, conferences, and professional medical associations.
The 96 videos included in the metrics were independently evaluated by two researchers experienced in hypospadias surgery. In cases of disagreement, a third independent evaluator was consulted. Prior to the evaluation, a standardization meeting was held to ensure calibration among the evaluators.
The following parameters were recorded to quantitatively measure the popularity of videos and their engagement in the online environment:

- Total view count
- Number of likes
- Video duration (minutes)
- Time on air (days).

Additionally, the following digital popularity indices, frequently used in the literature, were calculated to standardize user engagement (15):

- View Ratio: Total views/Upload duration (days)
- Like Ratio: [Number of likes/(Number of likes + Number of dislikes)] × 100
- Video Power Index (VPI): (Like Ratio × View Ratio)/100.

Educational quality and content assessment

The educational value, reliability, and procedural integrity of the videos were measured using four different structured scoring systems accepted in the literature:

1. *LAP-VEGaS Score*: A 16-item checklist that evaluates the educational quality and procedural reporting integrity of surgical videos. Each criterion (patient position, identification of anatomical structures, surgical steps, etc.) is evaluated as "*present/absent*," and the total score ranges from 0 to 16 (16).
2. *JAMA Criteria*: This tool evaluates four components – authorship, citations (sources), disclosure (conflicts of interest), and currency – to measure the reliability of medical information in the video. One point is awarded for each criterion, and the total score ranges from 0 to 4.
3. *Modified DISCERN Score*: A tool that evaluates the quality and reliability of online medical information using five "yes/no" questions. The maximum score is 5.
4. *GQS*: A subjective measure that evaluates the video's overall educational value, information flow, and usability. It is scored on a scale from 1 (very low quality) to 5 (excellent quality) (17).

Since this study was conducted on YouTube™, a publicly

accessible online platform, and did not involve any human or animal subjects or clinical interventions, it is exempt from ethics committee approval.

Statistical analysis

SPSS software (*IBM Corp., Armonk, NY, USA*) was used for statistical analyses. After assessing the distribution of the data, continuous variables were expressed as mean ± standard deviation and median values. The Mann-Whitney U test or the independent samples t-test was applied to compare individual and institutional groups; the chi-square test was used for categorical data.

Correlation analyses (*Spearman/Pearson*) were used to evaluate the relationship between educational quality scores (*LAP-VEGaS, GQS, etc.*) and popularity metrics (view count, VPI, etc.). Additionally, a multivariate linear regression analysis was conducted to identify the independent factors predicting the LAP-VEGaS score (channel type, video duration, VPI, and time on air). A p-value of < 0.05 was considered statistically significant.

Intraclass Correlation Coefficient (ICC) analysis was used to determine the inter-rater reliability among the three independent researchers. An ICC value greater than 0.75 was considered to indicate a good level of inter-rater agreement.

Results

General characteristics and popularity metrics of videos

Of the total 96 videos that met the search criteria and were included in the study, 53 (55.2%) were uploaded by individual users, while 43 (44.8%) were uploaded by institutional sources (universities, hospitals, associations, etc.). When comparing the groups in terms of metrics reflecting the visibility and popularity of videos in the virtual environment, it was found that the average view count ($p = 0.040$) and like count ($p = 0.017$) of videos from institutional channels were statistically significantly higher than those of individual videos (Table 1).

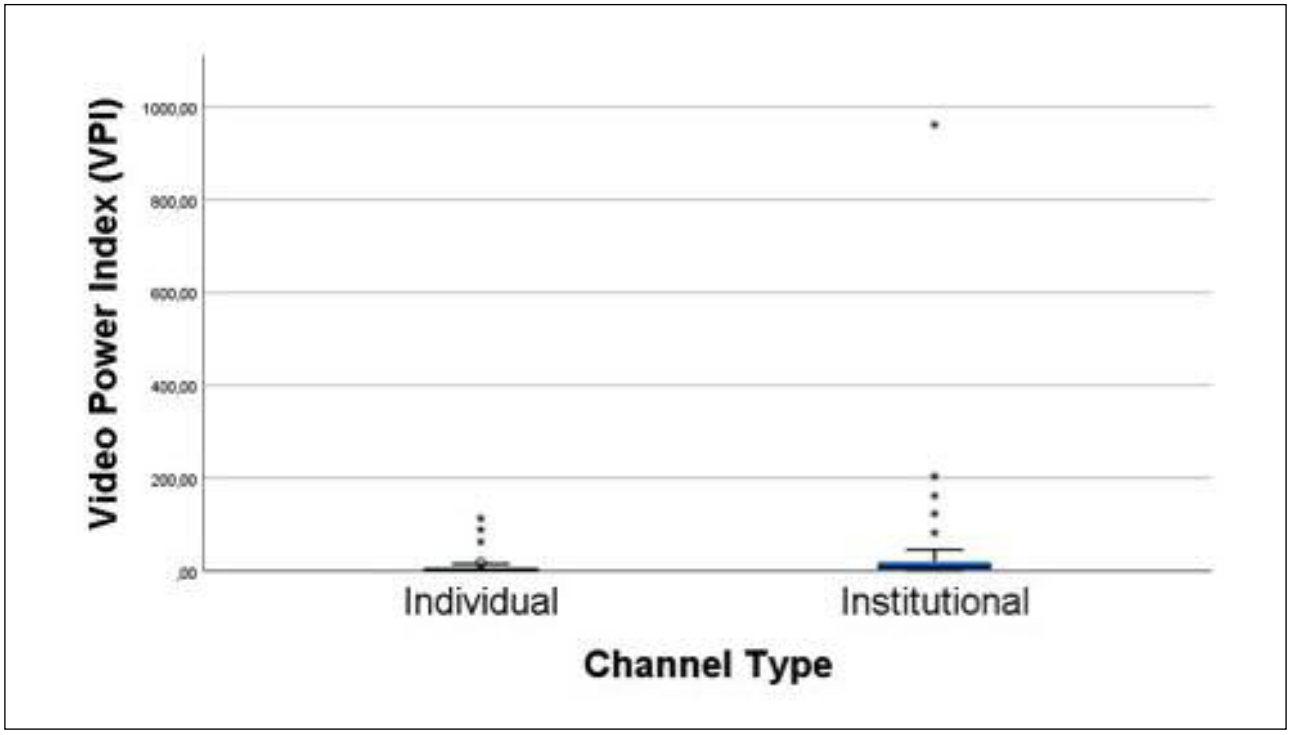
When examining popularity indices that standardize digital engagement, it was determined that the view rate ($p = 0.037$) and VPI ($p = 0.037$) of institutional videos were significantly higher than those of individual videos (Figure 1).

Table 1.
Baseline characteristics and popularity metrics of videos according to channel type.

Variable	Individual (n = 53)	Institutional (n = 43)	p-value
Number of views	7525 ± 11669 (3200)	24995 ± 56875 (8895)	0.040
Number of likes	70 ± 98 (28)	172 ± 253 (71)	0.017
Video duration (min)	8 ± 15 (4)	43 ± 53 (13)	< 0.001
Time since upload (days)	1501 ± 837 (1386)	1541 ± 1062 (1614)	0.857
View ratio	8.37 ± 20.73 (1.85)	43.87 ± 149.61 (8.98)	0.037
Like ratio	100 ± 0 (100)	100 ± 0 (100)	1.000
VPI	8.37 ± 20.73 (1.85)	43.87 ± 149.61 (8.98)	0.037

Values are presented as mean ± standard deviation (median).

Figure 1.
Distribution of Video Power Index (VPI) across channel types.



In contrast, no statistically significant difference was observed between the groups in terms of the like rate (p = 1.000) and the videos' duration on air (p = 0.857). When video durations were evaluated, it was observed that institutional videos (median: 13 min) were significantly longer than individual videos (median: 4 min) (p < 0.001), and the effect size of this difference was found to be large (r = 0.59).

Educational quality scores by channel type

When examining the educational quality parameters of videos assessed using structured tools, it was observed that institutional videos outperformed individual videos in all four scoring systems. The LAP-VEGaS (p = 0.041), Modified DISCERN (p < 0.001), JAMA (p = 0.031), and GQS (p = 0.003) scores for institutional videos are statistically significantly higher than those for individual videos (Table 2). This indicates that content produced at the academic or institutional level is more standardized and richer in terms of procedural integrity, reliability, and overall educational value.

Inter-rater reliability

The reliability analysis conducted among researchers reviewing the videos revealed a high level of agreement for all rating instruments. The *Intraclass Correlation Coefficient* (ICC) values were found to be 0.92 for LAP-VEGaS, 0.81 for JAMA, 0.87 for Modified DISCERN, and 0.78 for GQS. All these scores being above 0.75 indicates a statistically significant level of agreement between the raters (Figure 2).

The relationship between popularity metrics and educational quality

In correlation analyses conducted to determine the extent to which videos' popularity levels (interactions) reflect educational quality, a weak but statistically significant positive correlation (r = 0.236; p = 0.021) was found between the LAP-VEGaS score – which measures structured procedural reporting quality – and the VPI. Similarly, a moderate, positive, and significant correlation (r = 0.449; p < 0.001) was found between the total number of video views and the GQS score, which reflects the overall educational value.

Independent factors predicting the LAP-VEGaS score

A multiple linear regression analysis was performed to identify the independent variables (channel type, video duration, VPI, and time on air) that influence the LAP-VEGaS score, which represents the objective educational value of surgical videos. Although the model did not reach overall statistical significance (R^2 = 0.079; p = 0.110), it was found that among the variables included in the model, only "video duration" was an independent and significant predictor of the LAP-VEGaS score (β = 0.232; 95% CI: 0.000-0.019; p = 0.047) (Figure 3).

Table 2.
Educational quality scores according to channel type.

Score	Individual (n = 53)	Institutional (n = 43)	p-value
LAP-VEGaS	13 ± 1 (14)	14 ± 2 (15)	0.041
Modified DISCERN	4 ± 1 (4)	5 ± 0 (5)	< 0.001
JAMA	3 ± 1 (4)	4 ± 1 (4)	0.031
GQS	4 ± 1 (5)	5 ± 1 (5)	0.003

Figure 2.
Comparison of educational quality scores by uploader source.

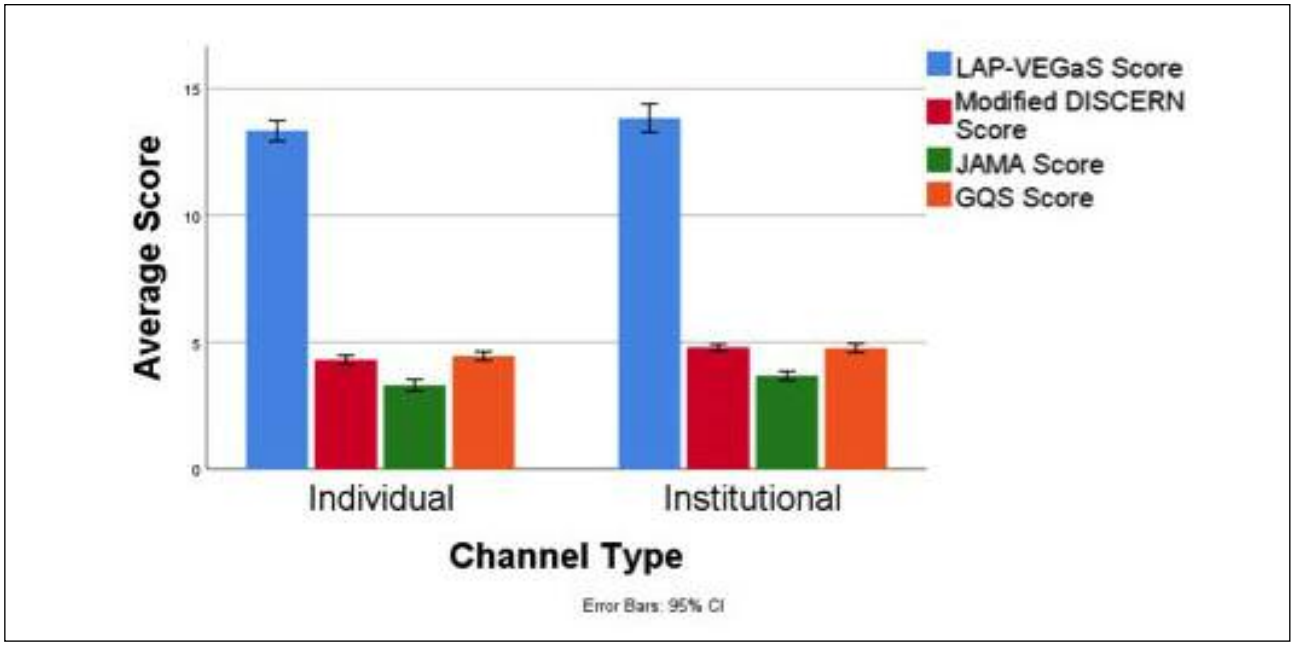


Figure 3.
Correlation between video duration and procedural reporting quality.

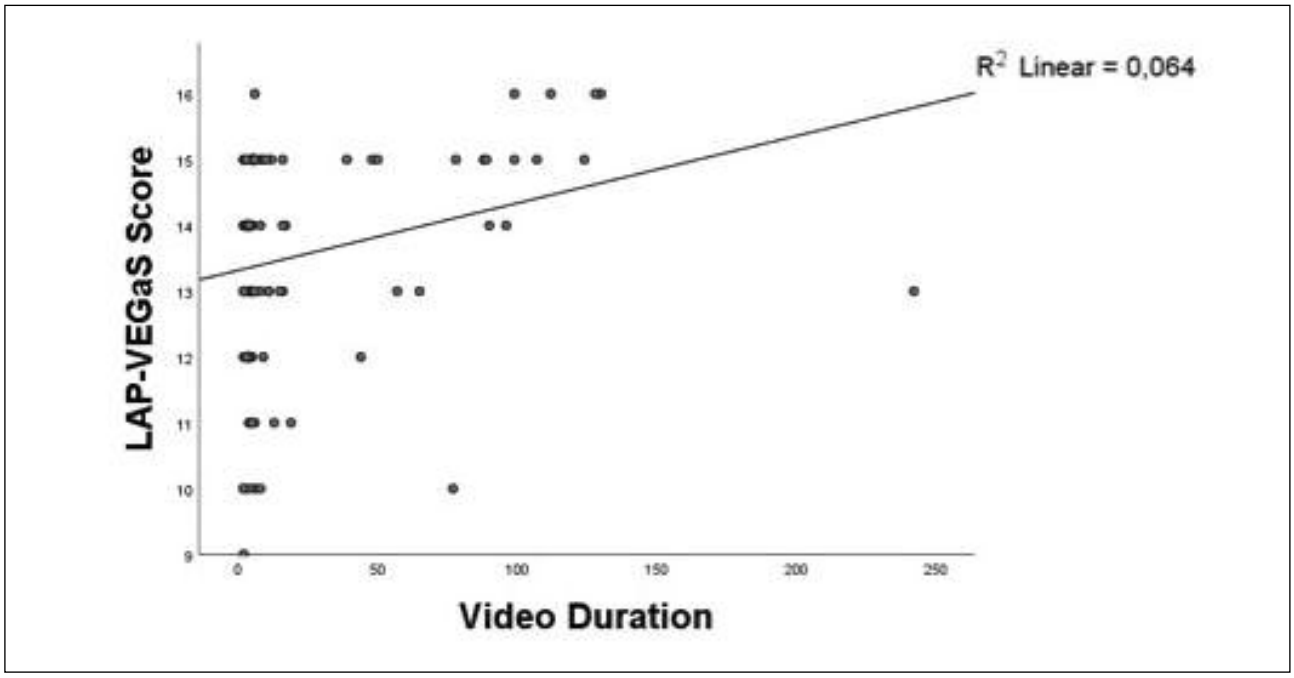


Table 3.
Multivariable linear regression analysis predicting LAP-VEGaS score.

Variable	β	95% CI	p-value
Channel type	0.033	-0.631 to 0.851	0.769
Video duration	0.232	0.000 to 0.019	0.047
VPI	0.116	-0.002 to 0.005	0.280
Time since upload	-0.045	-0.000 to 0.000	0.678

Channel type (p = 0.769), VPI (p = 0.280), and airtime (p = 0.678), however, did not show an independent and significant effect on educational quality in the multivariate analysis (Table 3).

Discussion

This study is the first comprehensive analysis to evaluate the educational quality of hypospadias surgery videos on the YouTube platform using structured scoring systems and to investigate the factors that predict this quality. The most notable findings of our study are that institutional videos offer significantly higher educational quality (LAP-VEGaS, JAMA, Modified DISCERN, and GQS) compared to individual videos, and that the sole independent factor predicting educational quality is "*video duration*." Some studies have also demonstrated a relationship between video duration and educational quality (18).

A review of the literature reveals that the superiority of institutional sources in surgical training videos is widely accepted. In their study examining laparoscopic radical prostatectomy videos, *Akdemir et al.* reported that institutional channels had significantly higher LAP-VEGaS, JAMA, and DISCERN scores compared to individual videos (15). Similar studies have also shown that institutional videos score higher than individual videos (19). *Lee and colleagues* emphasized the effectiveness of educational videos produced by experts in facilitating surgical learning (20).

Our findings support these studies, demonstrating that when institutional entities such as universities or medical associations produce videos with didactic concerns, this ensures a more detailed presentation of anatomical structures, standardization of procedural steps, and management of complications.

The question of whether a video's digital popularity reflects its educational quality remains highly debated in the literature. *Akdemir et al.* found a statistically significant positive correlation between the LAP-VEGaS score and popularity metrics (VPI, view counts, and likes), and suggested that the popularity index (VPI) could be used as a reliable assessment tool for educational quality. The fact that algorithms generally prioritize viewer engagement over educational accuracy explains why content with high educational value does not always gain greater visibility. In our study, however, a weak positive correlation ($r = 0.236$; $p = 0.021$) was found between LAP-VEGaS and VPI, while a moderate positive correlation ($r = 0.449$; $p < 0.001$) was found between GQS and view count.

This suggests that our findings fall somewhere between these two differing viewpoints in the literature; while popularity may offer a small clue about quality, it is not, on its own, a reliable or strong indicator.

The finding that distinguishes our study from the literature and constitutes the most original part of the article is our regression analysis results. In our multiple regression analysis, video duration – not channel type or VPI – was found to be the only independent predictor of the LAP-VEGaS score. The fact that institutional videos are signifi-

cantly longer than individual videos (median 43 min vs. 4 min) and that video duration is directly related to quality clearly demonstrates that a certain duration is essential for presenting critical surgical steps comprehensively and without omission in reconstructive procedures requiring high precision, such as hypospadias repair. Short and edited videos are insufficient for reflecting the entire surgery (21).

Limitations

This study has several limitations that should be taken into account. First, our analysis was limited to videos available on the YouTube platform; other closed or institutional video libraries used in surgical education, such as WebSurg, were not included in the evaluation. Second, since YouTube has a dynamic and constantly updated structure, video view counts, like rates, and engagement metrics may change over time. This study constitutes a cross-sectional analysis reflecting the time period during which the data were collected. Third, some of the tools used to assess educational quality (particularly the GQS and Modified DISCERN) inherently include components open to the evaluator's subjective judgment. Finally, the relatively low overall explanatory power of the model ($R^2 = 0.079$) in our regression analysis suggests that other factors not measured in this study – such as the surgeon's clinical experience, the quality of the narration, or the use of graphics and animations – may also influence the educational quality of the videos.

Conclusions

In conclusion, videos on hypospadias surgery available on the YouTube platform exhibit significant heterogeneity in terms of educational quality. Videos uploaded by institutional and academic sources are markedly superior in terms of structured educational quality (LAP-VEGaS, GQS, JAMA, Modified DISCERN) compared to those uploaded by individual users. However, metrics such as view count and VPI, which reflect a video's digital popularity, do not reliably reflect actual educational quality.

For surgical techniques to be fully and comprehensively understood, the duration of the videos (uncut) is the most important independent factor determining quality. For surgical assistants and specialists, relying on detailed, sufficiently long content produced by academic institutions rather than popular or short videos during preoperative preparation processes will provide a more reliable learning experience. Academically produced videos, prepared with didactic concerns in mind and covering sufficient surgical steps, provide reliable training by scoring significantly higher on structured assessment tools. Since digital popularity indicators do not reflect the true quality of training, surgical assistants will find it more reliable to use these detailed institutional videos for preoperative preparation.

Additionally, the adopting by video producers of standardized guidelines such as LAP-VEGaS is critical to improving the quality of online surgical education.

Declarations

Ethical approval and consent for participate: *This study involved publicly available data on the internet and did not involve human participants or animals; therefore, institutional ethics committee approval was not required.*

Consent to partecipate: *Not applicable.*

Consent for publication: *Not applicable.*

Competing interests: *The authors declare that they have no conflicts of interest.*

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The author(s) have reviewed and edited the output as needed and are fully responsible for the content of the published article.

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