

## Youtube as a source of information about Percutan Tracheostomy

Perkütan Trakeostomi hakkında bilgi kaynağı olarak Youtube

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### ABSTRACT

**Introduction:** Percutaneous tracheostomy one of the most common interventional procedures in the intensive care unit. The aim of our study is to investigate "Youtube" videos about percutaneous tracheostomy in the intensive care unit in terms of the information value and quality they provide.

**Material and Method:** Video search was performed on the "YouTube.com" in November 2021 with the "percutaneous tracheostomy" search key. The first 100 videos about percutaneous tracheostomy in the intensive care unit were listed and the number of views, likes, dislikes, comments, uploaded source, source country and continent were determined, and content analyzes were made. The quality, reliability and accuracy of the videos were determined by the "Global Quality Score"(GQS), "Journal of American Medical Association (JAMA) Quality Test" and "Modified DISCERN" questionnaire, respectively.

**Results:** According to GQS, 45 low, 31 medium and 24 high quality videos were detected. 72 of the videos contained insufficient, 25 partially sufficient and 3 completely sufficient data. Academic and doctor-sourced videos comprised the majority (70,83%) of the high-quality group. There was no significant relationship between video sources, GQS, JAMA score, Modified DISCERN score and the number of views, likes, dislikes and comments( $p>0,05$ ). A weak positive correlation was found between video duration and GQS( $r=0,206$ ), JAMA( $r=0,263$ ), modified DISCERN( $r=0,388$ ) scores( $p<0,05$ ).

**Conclusion:** According to our results, it was determined that most of the youtube videos about percutaneous tracheostomy in the intensive care unit were of poor quality and had insufficient data. It has been determined that high-quality videos are of longer duration and are uploaded by academic and doctor sources.

**Keywords:** E-learning, YouTube, Intensive care, Tracheostomy, Percutaneous

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### ÖZET

**Giriş:** Perkütan trakeostomi, yoğun bakım ünitesinde en yaygın yapılan girişimsel işlemler arasında yer almaktadır. Sağlık sunucuları sosyal medyayı da kullanarak sağlık ile ilgili bilgi erişimini sağlamaktadır. Çalışmamızın amacı yoğun bakım ünitesinde perkütan trakeostomi ile ilgili "Youtube" videolarını, sundukları bilgi değeri ve kalitesi açısından araştırmaktır.

**Materyal Metod:** İnternet video web sitesi "YouTube.com" arama motorunda herhangi bir filtre kullanılmadan "percutaneous tracheostomy" tarama anahtarı ile Kasım 2021 tarihlerinde video taraması yapıldı. Yoğun bakım ünitesinde perkütan trakeostomi ile ilgili ilk 100 video listelendi ve izlenme, beğeni, beğenilmeme, yorum sayıları, yükleyen kaynak, kaynak ülke ve kıta belirlendi, içerik analizleri yapıldı. Videoların kalitesi, güvenilirliği ve doğruluğu sırasıyla "Global Quality Score"(GQS), "Journal of American Medical Association (JAMA) Kalite Testi" ve "Modifiye DISCERN" anketi ile belirlendi

**Bulgular:** Çalışmamızda GQS sonuçlarına göre 45 düşük, 31 orta, 24 yüksek kaliteli video tespit edildi. Videoların 72'si yetersiz, 25'i kısmen yeterli, 3'ü tamamen yeterli veri içeriyordu. Akademik ve doktor kaynaklı videolar yüksek kaliteli grubun büyük kısmını (%70,83) oluşturmaktaydı. Video kaynakları, GQS, JAMA skoru, Modifiye DISCERN skoru ile izlenme, like, dislike, yorum sayısı arasında anlamlı ilişki bulunamadı ( $p>0,05$ ). Video süreleri ile GQS( $r=0,206$ ), JAMA( $r=0,263$ ), modifiye DISCERN( $r=0,388$ ) skorları arasında zayıf dereceli pozitif yönde korelasyon ilişkisi tespit edilmiştir( $p<0,05$ ).

**Sonuç:** Sonuçlarımıza göre yoğun bakım ünitesinde perkütan trakeostomi ile ilgili youtube videolarının çoğunun kötü kalitede ve yetersiz veriye sahip olduğu belirlendi. Yüksek kaliteli videoların daha uzun süreli olduğu, akademik ve doktor kaynaklar tarafından yüklendiği tespit edilmiştir.

**Anahtar Sözcükler:** E-öğrenme, YouTube, Yoğun bakım, Trakeostomi, Perkütan

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## INTRODUCTION

Percutaneous tracheostomy is one of the most frequently performed bedside invasive procedures in intensive care units (1-3). It was first described in 1957 and modified into its current form in 1985. It is reported that over 100,000 percutaneous tracheostomy procedures are performed annually in the United States (1). In the intensive care unit, compared to endotracheal intubation, tracheostomy offers numerous advantages such as improved patient comfort, reduced sedation requirements, easier airway clearance and oral care, decreased respiratory workload, and shorter intensive care stay (2, 3). The timing of tracheostomy (early or late) and the technique to be used (percutaneous serial dilation, percutaneous dilation, other new percutaneous techniques, or open surgical technique) in critically ill patients continue to be topics of debate (2-5).

In intensive care units, one of the important materials for healthcare provider training and patient education is videos related to percutaneous tracheostomy techniques (6-8). Especially during the Covid-19 pandemic, online and video-based education has played a significant role in addressing deficiencies in healthcare provider training (9, 10).

Studies have reported that approximately half of the adult population turns to the internet for health-related information. Not only medical students but also medical educators, doctors, auxiliary healthcare personnel, and even patients frequently visit YouTube to visually learn and interpret medical conditions (11). While there are studies on a wide range of topics on the YouTube platform as an information source, such as stroke, epilepsy, Parkinson's disease, rehabilitation of certain diseases, breast cancer, Behçet's disease, tube feeding, brachial plexus block, spinal and epidural anesthesia, and nerve blocks (12-23), there is no research specifically focusing on interventions and topics related to intensive care, particularly on YouTube as a source of information regarding percutaneous tracheostomy in the intensive care unit. Our study aims to evaluate the quality and reliability of YouTube videos related to percutaneous tracheostomy in the intensive care unit. The evaluation will be based on the sources of the videos, the number of views, likes, dislikes, comments, and video durations.

## MATERIALS and METHODS

Our study is a cross-sectional study conducted on November 4-5, 2021, after obtaining ethical approval from the non-interventional ethics committee of Dokuz Eylül University Faculty of Medicine (Ethics committee decision no: 6628-GOA, 2021/26-05 Date: 22.09.2021). To ensure no prior interactions and to prevent bias in research results, the computer's internet browser and YouTube history and cookies were cleared, and logouts from Google and YouTube accounts were performed before the search. Using the YouTube search engine (<https://youtube.com>), medical content videos related to percutaneous tracheostomy in the intensive care unit were identified by searching for the phrase "percutaneous tracheostomy."

Education-oriented videos, in English language, were selected by each researcher among the first 100 videos as in previous studies (20-25). The following information about the videos was collected: the number of likes and dislikes, view counts, video durations, comment numbers, publication year, video source (Academic, Doctor, Association/Professional Organization, Health-related Website, and Government Agency), presence of animation content, high definition (HD) quality, and the country and continent from which the videos were uploaded. Medical education videos were examined, and the quality, reliability, and accuracy of the videos were assessed using the GQS (Global Quality Score) (26), JAMA (Journal of American Medical Association quality test criteria) (27), and modified DISCERN (28) questionnaires. User engagement measurements were taken for each video. Since there was no established scoring system for the videos, when evaluating the content of each video, the presence or absence of 10 factors related to percutaneous tracheostomy in the intensive care unit was assessed. These factors included 1) Indications, 2) Contraindications, 3) Explanation of the procedure, 4) Serial Dilation Technique, 5) Other techniques (e.g., Klemple dilation), 6) Complications, 7) Information about Covid-19 and changes, 8) Timing of tracheostomy placement, 9) Use of ultrasound, and 10) Decannulation. In this study, a quantitative approach was adopted for data collection and analysis. For this purpose, research based on behavioral likes and view rates was developed.

Developed by Bernard et al. (26), GQS is a five-point Likert scale that assesses the quality, ease of use, and flow of websites. In the Global Quality Score (GQS), ratings are as follows: "5: Excellent quality and excellent flow, very useful for patients; 4: Good quality and generally good flow, beneficial for patients; 3: Moderate quality, suboptimal flow, somewhat useful for patients; 2: Generally low quality and poor flow, very limited utility for patients; 1: Poor quality, poor flow of the site, not useful at all for patients" (26).

### Journal of American Medical Association (JAMA) Quality Test Criteria

JAMA quality criteria evaluate online videos and sources based on four criteria: authorship, citation, disclosure, and currency. In the JAMA score, the criteria are rated as follows: "Authorship (1 point): Authors and contributors should provide affiliations and relevant identity information; Citation (1 point): References and sources should be listed for all content; Disclosure (1 point): Conflicts of interest, funding, sponsorship, advertising, support, and video ownership should be fully disclosed; Currency (1 point): Dates of content publication and updates should be provided." It is used to assess the accuracy and reliability of videos. The evaluator assigns 1 point for each of the specified criteria in the video, resulting in a final score ranging from 0 to 4, with four points indicating the highest quality (27).

### Modified DISCERN Questionnaire

This is a scoring tool consisting of 5 yes/no questions developed to assess the quality and reliability of health information publications (28). The score on this questionnaire ranges from 0 to 5, and the total score is obtained by summing the yes scores (yes=1 point, no=0 points). The questions in the questionnaire include: "Does the video address areas of controversy/uncertainty?", "Are additional information sources listed for patient reference?", "Is the information provided balanced and unbiased?", "Are valid sources cited? (valid studies, doctors)", "Is the video clear, concise, and understandable?" (28).

### User Engagement Assessment

Five user engagement measurements were determined and recorded for each video and updated regularly. These measurements included 1) video view count, 2) video like count, 3) video dislike count, 4) video duration, and 5) video comments. The data were collected on November 4-5, 2021, which was the date of the study (20-25).

### Evaluation Team

Data evaluation was independently performed by two scientists (E.Ö., V.H.) with over seven years of experience each. In cases where the evaluations by the researchers did not match, each video was reevaluated with the combined assessment of both scientists. Only videos intended for medical education and healthcare professionals were included in the analysis.

### Exclusion Criteria

Videos that were not related to percutaneous tracheostomy in the intensive care unit, videos in languages other than English, and repetitive or advertisement-based videos were excluded from the study.

### Statistical Analysis

The obtained data were analyzed using SPSS (Statistical Package for Social Sciences, Chicago, IL, USA) version 24.0. Continuous data were expressed as mean  $\pm$  standard deviation, while categorical data were presented as numbers (n) and percentages (%). The chi-square test was used for the analysis of categorical data, the Kruskal-Wallis test for continuous data analysis, and Pearson correlation test for correlation analyses. A p-value less than 0.05 was considered statistically significant.

## Results

In our study, the first 100 videos related to percutaneous tracheostomy in the intensive care unit and with medical content were examined by searching the YouTube search engine with the keyword "percutaneous tracheostomy" between November 4-5, 2021. A total of 16 hours, 38 minutes, and 50 seconds of video footage were viewed. The longest video was 1 hour, 40 minutes, and 10 seconds, while the shortest was 60 seconds. The video with the most likes received 5,300 likes, while the one with the least likes received 0 likes. The most

viewed video had 1,078,458 views, while the least viewed video had 6 views. The video with the most comments received 170 comments, while the one with the least comments received 0 comments. The average views per video were 30,221.00±114,690.05, the average likes were 216.61±719.94, the average dislikes were 5.47±12.26, the average comments were 6.69±24.05, and the average video duration was 599.26±860.34 seconds. It was determined that 23% of the videos contained animations, and there was 1% HD quality video. When

the videos were categorized by publication date, it was found that the majority, 43%, were published after 2020 on the YouTube platform (Table 1, Table 2). Of the videos, 50% were from the United States, 25% from India, 9% from the United Kingdom, and 16% from other countries. When the continents from which the videos were uploaded were evaluated, it was determined that 51% of the videos were from the Americas, and 49% were from countries outside the Americas.

**Table 1:** Video content analysis by year

Video Content/Year:		<2015, n (%)	2015-2019, n (%)	≥2020, n (%)	p
HD Video	Yes	0(%0)	0(%0)	1(%2.3)	0,512
	No	17(%100)	40(%100)	42(%97.7)	
Animation	Yes	1(%5.9)	9(%22.5)	13(%30.2)	0,129
	No	16(%94.1)	31(%77.5)	30(%69.8)	
Indication	Yes	4 (%23.5)	15 (%37.5)	18 (%41.9)	0,414
	No	13 (%76.5)	25 (%62.5)	25 (%58.1)	
Contraindication	Yes	3(%17.6)	7(%17.5)	5(%11.6)	0,714
	No	14(%82.4)	33(%82.5)	38(%88.4)	
Explanation of Procedure	Yes	13(%76.5)	35(%87.5)	36(%83.7)	0,582
	No	4(%23.5)	5(%12.5)	7(%16.3)	
Serial Dilatation Technique	Yes	9(%52.9)	25(%62.5)	29(%67.4)	0,575
	No	8(%47.1)	15(%37.5)	14(%32.6)	
Other Techniques (such as Clamp Dilatation)	Yes	5 (%29.4)	5 (%12.5)	11(%25.6)	0,222
	No	12 (%70.6)	35 (%87.5)	32(%74.4)	
Complications	Yes	5(%29.4)	5(%12.5)	18(%41.9)	<b>0,012</b>
	No	12(%70.6)	35(%87.5)	25(%58.1)	
Information and Changes Related to Covid-19	Yes	0(%0)	1(%2.5)	13(%69.8)	<b>&lt;0.001</b>
	No	17(%100)	39(%97.5)	30(%30.2)	
Timing of Tracheostomy Opening	Yes	1 (%5.9)	0(%0)	11(%25.6)	<b>0,001</b>
	No	16 (%94.1)	40(%100)	32(%74.4)	
Use of Ultrasound	Yes	0(%0)	2(%5.0)	2(%4.7)	0,651
	No	17(%100)	38(%95.0)	41(%95.3)	
Decannulation	Yes	1 (%5.9)	0(%0)	5(%11.6)	0,083
	No	16 (%94.1)	40(%100)	38(%88.4)	
Video Source	Academic	0(%0)	0(%0)	7(%16.3)	0,040
	Doctor	6(%35.3)	21(%52.5)	17(%39.5)	
Association Website	Health-related	2(%11.8)	5(%12.5)	8(%18.6)	
	Website	6(%35.3)	5(%12.5)	8(%18.6)	
Commercial Website	Government	2(%11.8)	8(%20)	2(%4.7)	
		1(%5.9)	1(%2.5)	1(%2.3)	
JAMA	Insufficient (1 Point)	13(%76.5)	33(%82.5)	26(%60.5)	0,120
	Partially Sufficient (2/3 Points)	4(%23.5)	7(%17.5)	14(%32.6)	
Fully Sufficient (4 Points)		0(%0)	0(%0)	3(%7)	
GQS	Low Quality (1/2 Points)	11 (%64.7)	21 (%52.5)	13 (%30.2)	0,106
	Medium Quality (3 Points)	4(%23.5)	10 (%25.0)	17 (%39.5)	
High Quality (4/5 Points)		2 (%11.8)	9 (%22.5)	13 (%30.2)	
Modified DISCERN	1 Point	1 (%5.9)	2 (%5.0)	1 (%2.3)	0,313
	2 Points	14 (%82.4)	37 (%92.5)	32 (%74.4)	
3 Points		1 (%5.9)	1 (%2.5)	3 (%7.0)	
4 Points		1 (%5.9)	0(%0)	6 (%14.0)	
5 Points		0 (%0)	0(%0)	1(%2.3)	

Chi-square test HD: High Definition, GQS: Global Quality Score, JAMA: Journal of American Medical Association quality criteria

**Table 2:** Video Interaction Characteristics by Year and Evaluation Criteria

Years	Views Mean±SD	Likes Mean±SD	Dislikes Mean±SD	Comments Mean±SD	Duration (s) Mean±SD
<2015(n=17)	77093,17±258608,61	57,82±129,71	3,76±5,52	1,00±1,58	762,65±1363,91
2015-2019 (n=40)	34905,10±62902,08	448,17±1085,98	9,70±17,58	13,45±36,47	329,47±172,11
≥2020(n=43)	7332,83±20183,26	63,97±187,34	2,20±5,18	2,65±7,35	785,63±944,92
<b>p</b>	<b>&lt;0,001</b>	0,086	<b>0,044</b>	0,490	<b>0,007</b>
<b>Video Source</b>					
Academic (n=7)	1126,00±1551,49	9,85±13,00	0,71±1,49	0,42±0,78	1928,71±1791,35
Doctor (n=44)	12015,65±29510,75	164,36±518,97	5,77±12,57	7,95±26,62	593,14±904,64
Association Website (n=15)	31144,53±48569,76	249,80±427,54	6,60±10,91	0,60±1,24	421,53±423,70
Health-related Website (n=19)	88226,15±250776,02	505,47±1381,11	8,36±17,64	15,63±36,32	509,68±270,33
Commercial Website (n=12)	14918,91±29480,52	66,58±206,69	2,00±5,09	0,75±2,05	324,25±202,52
Government (n=3)	54345,66±24274,04	70,00±78,58	2,00±2,00	0,33±0,57	143,00±107,17
<b>p</b>	0,147	0,268	0,558	0,134	<b>&lt;0,001</b>
<b>GQS (1-5 points)</b>					
Low Quality (1/2 points) (n=45)	39320,48±162568,72	108,40±494,21	3,15±9,52	2,62±10,30	430,36±364,49
Medium Quality (3 points) (n=31)	17722,32±35646,81	183,09±345,13	5,64±10,24	3,64±9,85	708,77±1106,82
High Quality (4-5 points) (n=24)	29303,58±63471,80	462,79±1233,18	9,58±17,58	18,25±44,44	774,50±1109,04
<b>p</b>	0,977	0,132	0,124	0,255	0,132
<b>JAMA Score (0-4 Points)</b>					
Insufficient Data (1 Point) (n=72)	35909,22±133304,94	261,29±827,80	5,98±13,17	8,87±28,04	516,38±746,15
Partially Sufficient Data (2/3 points) (n=25)	17439,20±36187,01	113,40±296,90	4,64±10,10	1,16±2,73	720,72±1057,85
Fully Sufficient Data (4 points) (n=3)	218,66±78,23	4,33±1,52	0,00±0,00	0,33±0,57	1576,33±1258,04
<b>p</b>	0,102	0,283	0,229	0,107	<b>0,021</b>
<b>Modified DISCERN Score (0-5 points)</b>					
1 Point (n=4)	5054,50±7336,87	14,00±16,30	5,50±6,13	1,25±2,50	223,00±114,12
2 Points (n=83)	35428,98±125308,85	251,33±784,41	6,06±13,22	7,85±26,25	513,18±699,91
3 Points (n=5)	11321,20±14808,26	141,20±226,99	3,80±6,87	2,20±3,03	503,80±204,50
4 Points (n=7)	625,71±495,10	4,57±2,07	0,42±0,78	0,00±0,00	1556,00±1796,53
5 Points (n=1)	290,00	6,00	0,00	1,00	3029,00
<b>p</b>	0,348	0,415	0,410	0,297	<b>0,009</b>

Kruskal-Wallis Test

n: Number of Videos, SD: Standard Deviation, GQS: Global Quality Score, JAMA: Journal of American Medical Association Quality Test Criteria

Regarding videos related to Percutaneous Tracheostomy, 37% of them contained information about indications, 15% about contraindications, 84% about procedure explanation, 63% about serial dilational technique, 21% about other techniques (such as Klemple dilatation), 28% about complications, 14% about changes related to Covid-19, 12% about timing of tracheostomy, 6% about decannulation, and 4% about the use of ultrasound (Table 1).

When the quality of videos was assessed using GQS score, 45% of videos were rated as low quality, 31% as medium quality, and 24% as high quality according to GQS results. When examined by the source of the videos, it was found that 71.4% of videos from academic sources and 27.3% of videos from doctor sources were of high quality. There was a statistically significant relationship between the sources of videos and the quality and reliability scales, which are GQS, modified DISCERN, and JAMA ( $p<0.001$ ). However, there was no statistically significant difference between the video sources and the number of views, likes, dislikes, and comments ( $p>0.05$ ) (Table 2, Table 3).

**Table 3:** Evaluation According to Video Source

		Academic	Doctor	Association Website	Health-Related Website	Commercial Website	Government	p
GQS (Global Quality Score) (1-5 points)	Low quality (1/2 points) (n=45)	0(%0)	15(%34,1)	8(%53,3)	10(%52,6)	11(%91,7)	1(%33,3)	<b>0,003</b>
	Medium quality (3 points) (n=31)	2(%28,6)	17(%38,6)	6(%40,0)	4(%21,1)	1(%8,3)	1(%33,3)	
	High quality (4/5 points) (n=24)	5(%71,4)	12(%27,3)	1(%6,7)	5(%26,3)	0(%0)	1(%33,3)	
JAMA Score (0-4 Points)	Insufficient data (1 Point) (n=72)	1(%14,3)	33(%75)	11(%73,3)	15(%78,9)	9(%75)	3(%100)	<b>&lt;0.001</b>
	Partially adequate data (2/3 points) (n=25)	3(%42,9)	11(%25)	4(%26,7)	4(%21,1)	3(%25)	0(%0)	
	Completely adequate data (4 points) (n=3)	3(%42,9)	0(%0)	0(%0)	0(%0)	0(%0)	0(%0)	
	Modified 1 Point (n=4)	0(%0)	2(%4,5)	0(%0)	0(%0)	2(%16,7)	0(%0)	
DISCERN Score (0-5 points)	2 Points (n=83)	1(%14,3)	37(%84,1)	14(%93,3)	18(%94,7)	10(%83,3)	3(%100)	
	3 Points (n=5)	0(%0)	4(%9,1)	1(%6,7)	0(%0)	0(%0)	0(%0)	
	4 Points (n=7)	5(%71,4)	1(%2,3)	0(%0)	1(%5,3)	0(%0)	0(%0)	
	5 Points (n=1)	1(%14,3)	0(%0)	0(%0)	0(%0)	0(%0)	0(%0)	

Chi-square test

GQS: Global Quality Score, JAMA: Journal of American Medical Association quality test criteria

There is a weak positive correlation between video durations and JAMA score ( $r=0.263$ ;  $p<0.01$ ), modified DISCERN score ( $r=0.388$ ;  $p<0.01$ ), and GQS (Global Quality Score) results ( $r=0.206$ ;  $p<0.05$ ).

This suggests that videos with higher quality and reliability have longer durations (Table 4). A similar situation is observed between video source and durations. Videos from academic sources have longer durations ( $p<0.001$ ) (Table 3).

**Table 4:** Correlations between quality variables and interaction parameters

	GQS	JAMA	Modified DISCERN	Number of views	Number of likes	Number of dislikes	Number of comments	Video duration	Year of upload
GQS	----	0,460**	0,521**	-0,044	0,159	0,176	0,206*	0,206*	0,250*
JAMA	0,460**	----	0,785**	-0,096	-0,114	-0,121	-0,134	0,263**	0,179
Modified DISCERN	0,521**	0,785**	----	-0,067	-0,068	-0,120	-0,071	0,388**	0,164
Number of views	-0,044	-0,096	-0,067	----	0,322**	0,287**	0,250*	-0,046	-0,310**
Number of likes	0,159	-0,114	-0,068	0,322**	----	0,872**	0,882**	-0,082	0,007
Number of dislikes	0,176	-0,121	-0,120	0,287**	0,872**	----	0,785**	-0,110	-0,045
Number of comments	0,206*	-0,134	-0,071	0,250*	0,882**	0,785**	----	-0,069	0,023
Video duration	0,206*	0,263**	0,388**	-0,046	-0,082	-0,110	-0,069	----	0,036
Year of upload	0,250*	0,179	0,164	-0,310**	0,007	-0,045	0,023	0,036	----

\*\* $p<0.01$  Pearson correlation test\* $p<0.05$  Pearson correlation test

GQS: Global Quality Score JAMA: Journal of American Medical Association quality test criteria

There is no statistically significant difference between the countries where videos are uploaded and the number of views ( $p=0.785$ ), likes ( $p=0.310$ ), dislikes ( $p=0.312$ ), and duration ( $p=0.960$ ) of the videos. However, a significant difference was observed in the number of comments ( $p<0.007$ ). Videos prepared by countries other than India, America, and the UK, especially by countries outside these three, have a higher number of comments. There is no statistically significant difference between the continents where videos are uploaded and video characteristics ( $p>0.05$ ).

## DISCUSSION

In our study, we conducted an analysis of YouTube videos in English related to percutaneous tracheostomy in the intensive care unit. Many of the videos in our sample were rated as poor quality, with low reliability and insufficient data scores.

We found that videos with higher quality and reliability tended to have longer durations and were predominantly uploaded by academic and medical sources. However, we did not identify a significant correlation between these scores and video interaction parameters.

YouTube, established in 2005 in San Bruno, California, United States, is a video hosting website where approximately 100 videos are uploaded every minute by users. These videos are sourced from unverified and non-peer-reviewed channels (30). While YouTube was initially designed for entertainment, it has evolved into a platform where a significant amount of health-related content is shared. In today's world, with the increasing influence of the internet and social media, YouTube has become a preferred source of information for patients and a platform for healthcare professionals to stay updated and receive education. Consequently, studies evaluating the content, quality, and reliability of medical content on YouTube have been on the rise (12-25, 29, 30).

In our study, we noted an increase in the number of videos related to percutaneous tracheostomy between 2015 and 2019, but the highest number of videos were uploaded after 2020.

The COVID-19 pandemic significantly contributed to this increase, as disruptions in face-to-face education led healthcare providers to turn to internet-based and video-based educational tools. Therefore, we believe that the rapid increase in demand for information during the pandemic led to the uploading of more videos on this topic (9, 10).

Previous studies evaluating the content, quality, and reliability of YouTube videos have generally pointed out deficiencies in the content. It is important to note that YouTube video sources vary, and when video quality is analyzed in subgroups based on the sources of uploaders, diversity is observed. For instance, in a study by Selvi et al., they found that most YouTube videos related to brachial plexus blocks were inadequate for guiding those seeking information. Tulgar et al., in their evaluation of YouTube videos on spinal anesthesia, epidural anesthesia, and spinal-epidural anesthesia, emphasized that videos prepared by institutes and associations had higher educational value, but in general, the educational value of the videos was deficient. Boztas et al., in their study on anterior abdominal wall blocks, found that 58% of the videos were inadequate. Fischer et al., after watching YouTube videos for knee arthrocentesis, recommended some of these videos for students, residents, or fellows, but they also noted that some videos, despite being published by healthcare professionals, contained insufficient and low-quality content. Cassai et al., in their evaluation of YouTube videos related to erector spinae plane block, found that these videos were generally of low quality, with academic videos having higher quality compared to non-academic ones. Yildiz et al., in their study on vestibular rehabilitation on YouTube, reported that video content was of poor quality, but they suggested that the addition of high-quality videos by healthcare professionals could reduce vestibular symptoms in patients. Springer et al., in their study on postoperative rehabilitation and return to sports after anterior cruciate ligament repair, highlighted that videos prepared by healthcare professionals were of higher quality. Similarly, Tolu et al. indicated that videos uploaded by doctors, academic sources, and professional organizations offered higher-quality content. Our study aligns with the existing literature, indicating that YouTube videos related to percutaneous tracheostomy generally have low quality and reliability, but videos uploaded by academic and medical sources tend to have higher quality and reliability compared to other sources. However, despite healthcare-related websites offering lower-quality content, their videos receive more views, likes, dislikes, and comments, possibly because they use more advertising to increase video engagement and reach more users. Video duration can be considered a criterion reflecting the quality and comprehensiveness of video content. According to our findings, videos with high reliability and quality tend to have longer durations. This can be interpreted as a need for more time to provide high-quality video content. In the literature, Ozdemir et al. found that high-quality videos on cancer rehabilitation on YouTube were longer in duration. When designing video duration, the aim should be to provide quality information without distracting the viewer while ensuring that all necessary information is delivered.

In our study, we observed significant changes in the content of videos over the years. For instance, videos related to percutaneous tracheostomy increasingly mentioned complications, timing of tracheostomy, and changes related to COVID-19 after 2020. Indeed, a review of the literature shows an increase in publications related to percutaneous tracheostomy, its timing, and complications in COVID-19 patients in 2020 (38-40). Our study has some limitations. Firstly, our sample size was small, as we only included the first 100 videos on this topic. Secondly, we only included videos in English, which is another limitation. We could not include non-English videos, so we could not incorporate information and experiences from other countries. However, given that English is the most widely spoken language worldwide, this limitation may not significantly impact our study's results.

## CONCLUSION

This study analyzed YouTube videos in English related to percutaneous tracheostomy in the intensive care unit. Many of the videos in our sample were of poor quality, with low reliability and inadequate data scores. We found that videos with high quality and reliability tended to be longer in duration and were predominantly uploaded by academic and medical sources. Despite offering lower-quality content, videos from healthcare-related websites received more views, likes, dislikes, and comments, likely due to their increased use of advertising to enhance video engagement and reach a broader audience.

Overall, YouTube, considered a valuable source of information, may benefit from the creation of high-quality content by academic sources and doctors, thereby enhancing the knowledge and awareness of individuals seeking information on percutaneous tracheostomy in the intensive care unit.

## Conflict of interest

No conflict of interest was declared by the authors.

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