



## EVALUATION OF VIDEOS PUBLISHED ON YOUTUBE REGARDING FLUID RESUSCITATION

YOUTUBE'DA SIVI RESÜSİTASYONU İLE İLGİLİ YAYINLANAN VİDEOLARIN DEĞERLENDİRİLMESİ

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### ABSTRACT

**Introduction:** Fluid resuscitation includes a wide variety of products, usually classified as crystalloids or colloids. Although crystalloids and colloids are frequently used in fluid resuscitation, the ideal fluid for resuscitation remains controversial. In this study, we aimed to evaluate the reliability of the information given by physician channels and physicians about fluid resuscitation on YouTube.

**Methods:** To identify appropriate videos, a standard YouTube search was performed on 01.09.2024 using the terms “fluid resuscitation”, “fluid resuscitation in trauma patient” and “fluid resuscitation in burn patient”. Multiple scoring systems were used to evaluate the videos, including DISCERN, a validated tool for analyzing the quality of health information in consumer-targeted videos, the Journal of the American Medical Association (JAMA) and the Global Quality Score (GQS). All statistical tests were performed using SPSS version 27 (IBM®, Chicago, USA). Mean±standard deviation was used for descriptive statistics and numerical data with normal distribution. Median (minimum-maximum) was used for abnormally distributed data. Nominal data were expressed as numbers and percentages.

**Results:** After excluding 77 videos (32 videos were not in English, 31 videos were not physician-generated, 14 videos were longer than 1.5 hours), 73 videos were evaluated in our study. The mean values (mean±sd) of the GQS, 5-point modified DISCERN and JAMA scores of the videos were 3.55±1.06, 3.41±1.17 and 2.62±0.93, respectively. In the GQS grouping, 17.8% of the videos analyzed were of poor quality, 27.4% were of moderate quality and 54.7% were of high quality.

**Conclusions:** Our study shows that physician-generated fluid resuscitation videos on YouTube are generally of acceptable quality. Future studies could obtain more comprehensive results by evaluating content in different languages.

**Keywords:** YouTube videos, fluid resuscitation, web-based health information

### ÖZET

**Giriş:** Sıvı resüsitasyonu, genellikle kristaloidler veya kolloidler olarak sınıflandırılan çok çeşitli ürünleri içerir. Kristaloidler ve kolloidler sıvı resüsitasyonunda sıklıkla kullanılsa da, resüsitasyon için ideal sıvı tartışmalıdır. Bu çalışmada, YouTube'da hekim kanalları ve hekimler tarafından yayınlanan sıvı resüsitasyonu ile ilgili videolarda verilen bilgilerin güvenilirliğini değerlendirmeyi amaçladık.

**Yöntemler:** Uygun videoları belirlemek amacıyla 01.09.2024 tarihinde “sıvı resüsitasyonu”, “travma hastasında sıvı resüsitasyonu” ve “yanık hastasında sıvı resüsitasyonu” terimleri kullanılarak standart bir YouTube araması gerçekleştirildi. Videoların değerlendirilmesinde, tüketici odaklı sağlık bilgilerini analiz etmek için doğrulanmış bir araç olan DISCERN, Amerikan Tabipler Birliği Dergisi (JAMA) ve Global Kalite Skoru (GQS) gibi çeşitli puanlama sistemleri kullanıldı. Tüm istatistiksel testler SPSS versiyon 27 (IBM®, Chicago, ABD) kullanılarak gerçekleştirildi. Tanımlayıcı istatistikler ve normal dağılım gösteren sayısal veriler için ortalama±standart sapma kullanıldı. Normal dağılmayan veriler için medyan (minimum-maksimum) kullanıldı. Nominal veriler sayı ve yüzde olarak ifade edildi.

**Bulgular:** 77 video (32'si İngilizce değil, 31'i hekim tarafından oluşturulmamış, 14'ü 1,5 saatten uzun) dışlandıktan sonra, toplam 73 video çalışmamıza dahil edildi. Videoların GQS, 5 puanlık modifiye DISCERN ve JAMA puanlarının ortalama değerleri sırasıyla 3,55±1,06; 3,41±1,17 ve 2,62±0,93 olarak bulundu. GQS gruplamasına göre incelenen videoların %17,8'i düşük kaliteli, %27,4'ü orta kaliteli ve %54,7'si yüksek kaliteli olarak değerlendirildi.

**Sonuç:** Çalışmamız, YouTube'da hekimler tarafından oluşturulan sıvı resüsitasyonu videolarının genel olarak kabul edilebilir kalitede olduğunu göstermektedir. Gelecekte yapılacak çalışmalar, farklı dillerdeki içerikleri de değerlendirilerek daha kapsamlı sonuçlara ulaşabilir.

**Anahtar Kelimeler:** YouTube videoları, sıvı resüsitasyonu, web tabanlı sağlık bilgisi

### INTRODUCTION

Fluid resuscitation includes a wide variety of products, usually classified as crystalloids or colloids. Crystalloids include isotonic and hypertonic solutions and are further classified as unbuffered (e.g. isotonic saline) and buffered

solutions (e.g. Ringer's lactate, acetate, maleate). In addition, the colloid family consists of hypo-oncotic (e.g. gelatins, 4% or 5% albumin) and hyper-oncotic solutions (e.g. dextran, hydroxyethyl starches and 20% or 25% albumin). Ideally, colloidal solutions are considered more effective than crystalloids in terms of the amount of fluid

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remaining in the intravascular space(1); therefore, less fluid is required when using colloids compared to crystalloids to achieve similar hemodynamic goals (2). However, these fluids have raised concerns about altering immune responses to critical illness (1,3). There are also concerns that hydroxyethyl starches may increase the risk of death and acute kidney injury (AKI) (4).

Although crystalloids and colloids are frequently used in fluid resuscitation, the ideal fluid for resuscitation remains controversial. Several previous meta-analyses have attempted to investigate the superior fluid resuscitation therapy between colloids and crystalloids. For example, Choi and colleagues reviewed data from 17 studies with 814 patients and found no significant difference between colloids and isotonic crystalloids in overall survival, length of hospital stay and incidence of pulmonary edema. However, traumatic patients resuscitated with crystalloids showed significantly lower mortality rates than those resuscitated with colloids(5). On the other hand, two previous comprehensive reviews of critically ill patients showed that fluid resuscitation with crystalloids provided no mortality advantage compared to colloids (6,7). Based on the evidence in these previous reviews, it is clear that there is still a controversy about which resuscitation fluid is superior.

With the widespread use of the internet in the late 1990s, people's sources of information began to change significantly. Information received from written tools such as books and magazines was replaced by computers, and from there by more portable tools such as laptops and smartphones that are with us every moment of our lives. Undoubtedly, the information explosion that emerged with these technological developments spread rapidly in the field of health as in every field. Information that was previously only available in written form through websites can now be accessed both visually and audibly through social media. YouTube, one of these social media tools, stands out as the second most used search engine in the world(8). Available in 80 languages and in more than 100 countries, YouTube's global importance is demonstrated by the fact that it is an accessible social media app; more than 2.5 billion people use YouTube, one billion hours of video are watched every day, and 400 hours of video are uploaded to YouTube every minute worldwide(9). Social media has now become an important source of health information for people and it is inevitable that people will use such a popular website as a source of health-related searches and information.

The fact that the responsibility for the video content published on YouTube lies solely with the person who uploads the video is one of the most important factors in the widespread use of the application; however, this situation can also be considered as one of the main reasons why the uploaded videos show a great lack of quality and reliability. The application algorithm, which increases the potential to reach more people with more views and likes, has meant

that videos posted on this particular platform are left unchecked and considered a source of dubious information. Due to the complete absence of a peer review process, concerns about the quality and reliability of videos accessed via YouTube in the medical field have led to many studies focusing on this issue(10). The YouTube video has been evaluated for video quality by various medical specialties including urology, rheumatology, anesthesiology, general surgery, dermatology and orthopedics(11-16).

In parallel with previously published studies, this study aims to evaluate the reliability of physician channels and physician-provided information on fluid resuscitation on YouTube.

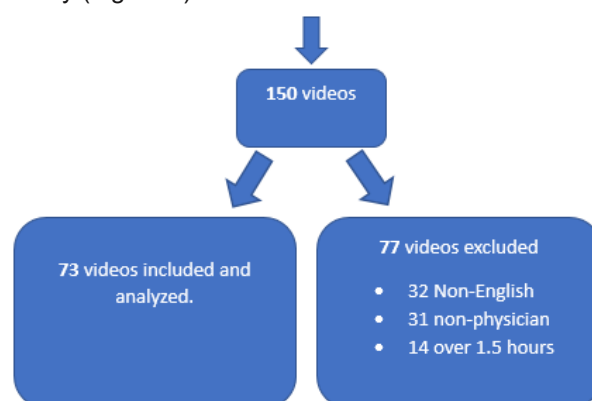
## METHODS

The data set comprised the analysis of videos on the international social networking platform YouTube. As no human or animal subjects were involved in the study, and all videos used for the study were publicly accessible, ethics committee approval was not sought. Patient consent was not required.

### Video Search on YouTube

The official YouTube website (<https://www.YouTube.com>) was used as the platform for social media content. On 01.09.2024, a YouTube search for the phrases "fluid resuscitation", "fluid resuscitation in trauma patient" and "fluid resuscitation in burn patient" was performed using "incognito mode" and without connecting to a google account. Search results were set by default in the YouTube browser. Only English videos were included in the study. Videos longer than 1.5 hours, videos not originating from a doctor, and non-English language videos were excluded.

A total of 150 videos were evaluated. 32 non-English videos, 31 non-doctorial videos and 14 videos longer than 1.5 hours were excluded. 73 English videos were included in the study (Figure 1).



**Figure 1.** Flow chart. A total of 150 videos were evaluated. 32 non-English videos, 31 non-doctorial videos and 14 videos longer than 1.5 hours were excluded. 73 English videos were included in the study.

### Video characteristics

We analyzed the features of the videos such as views, upload date, daily views, duration, source, likes and comments.

### Video sources

The sources of the videos were in one category: physicians or academics.

### Video Quality Analysis

Two independent emergency medicine specialists evaluated the video content. The arithmetic mean of the scores of both researchers was taken. The videos were evaluated in terms of definition, complications, symptoms/signs, and treatments in terms of fluid resuscitation.

Journal of the American Medical Association (JAMA) benchmarks, Global Quality Score (GQS), and modified DISCERN were used to assess the quality of the videos. The JAMA score is derived from criteria such as authorship, citation, validity, and description used to determine the reliability of online resources. A total score of '4' indicates high reliability.

The GQS is a five-point Likert scale based on information quality, flow of information available online, and ease of use, with scores ranging from 1 to 5. A score of "5" indicates excellent quality. DISCERN is an information quality assessment tool created by Charnock et al.(17). It was modified to a 5-question survey by Singh et al in 2012 (18).

To evaluate the popularity of videos, video power index (VPI) (like rate  $\times$  view rate [daily views/100]) was calculated.

### Calculation of scoring systems

GQS is a video quality assessment tool that has been the subject of many studies(19-22).

1. Low quality, poor video information flow, most of the information is missing, not useful for patients.

2. Generally poor information quality and flow, some listed information and many important topics are missing, very limited use by patients.

3. Moderate quality, poor information flow and some important information is sufficiently discussed, but some is poorly discussed and somewhat useful for patients.

4. Good quality and generally good information flow. Most of the relevant information is listed, but some topics are not covered, useful for patients.

5. Excellent quality and information flow, very useful for patients.

As a measure of quality, the JAMA score evaluates 4 areas: authorship (affiliation, contribution, credentials), citation (source, copyright), disclosure (website ownership, sponsors, advertising, etc.), and whether the content is up-to-date (publication date, updates) (23). Each of the 4 areas is worth 1 point, making a total of 4 possible points.

The reliability of the videos was assessed with a modified DISCERN tool with a 5-point scale. The modified version of the tool used in this study consisted of five yes/no questions, with each "yes" answer having a score of 1. Therefore, the highest possible score is 5.

Questions include:

- 1) Is the video clear, concise, and understandable?
- 2) Are valid sources cited?
- 3) Is the information provided balanced and unbiased?
- 4) Are additional sources of information listed for patient reference?
- 5) Does the video address controversial/ambiguous areas?

### Statistical analysis

All statistical tests were performed using SPSS version 27 (IBM®, Chicago, USA). Mean $\pm$ standard deviation was used for descriptive statistics and numerical data showing normal distribution. Median (minimum-maximum) was used for data showing abnormal distribution. Nominal data were expressed as numbers and percentages.

### RESULTS

After excluding 77 videos (32 videos were not in English, 31 video narrators were not physicians, and 14 videos were longer than 1.5 hours), 73 videos were evaluated. The characteristics of these videos are summarized in Table 1.

**Table 1.** Features of videos

	All videos (N=73)
	Mean $\pm$ sd
Number of views	56870 $\pm$ 228413
Time since upload date (months)	1800 $\pm$ 1165
View ratio (views/day)	127.53 $\pm$ 319.35
Duration (minute)	22.37 $\pm$ 19.41
Number of likes	1119 $\pm$ 5639
Number of comments	21.77 $\pm$ 85.61

Looking at previous studies, there were many quality rating tools (QRTs) used to evaluate video quality. QRTs used in these studies were categorized as externally validated, internally validated, and limited global. JAMA, GQS, and mDISCERN scores were the scales used in our study because they are externally validated scales that have been evaluated as QRTs in previous studies.[19]. Therefore, we evaluated the quality of the videos with the GQS and JAMA scores, and the reliability of the videos with the modified DISCERN score.

In our study, the mean values (Mean±sd) of GQS, 5-point modified DISCERN and JAMA scores were 3.55±1.06, 3.41±1.17 and 2.62±0.93, respectively (Table 2).

The Global Quality Scale (GQS) used for the quality of videos was divided into 3 groups: low quality (GQS scores: 1-2 points), medium quality (GQS scores: 3 points), high quality (GQS scores: 4-5 points). After GQS grouping, video source and features were evaluated for further analysis and it was found that 17.8% of the analyzed videos were of poor quality, 27.4% of medium quality and 54.7% of high quality. The average values of the videos from the scales and their quality evaluations are summarized in Table 2.

**Table 2.** Quality assessments of videos

	All videos (N=73)
	Mean±sd
GQS	3.55±1.06
GQS group*	
Low quality (1-2)	13 (17.8)
Moderate quality (3)	20 (27.4)
High quality (4-5)	40 (54.7)
mDISCERN	3.41±1.17
JAMA	2.62±0.93
VPI	37±164.48

\*N (%), GQS; Global Quality Score, JAMA; Journal of the American Medical Association, VPI: Video Power Index, mDISCERN; Modified DISCERN

## DISCUSSION

This study is the first to evaluate the reliability of physician-based videos on fluid resuscitation on YouTube.

YouTube has increasingly been used as a source of medical information, and the platform has become an important educational tool for healthcare professionals. However, due to the lack of control over content and the lack of a peer-review process, there are concerns about the quality of information. Our rationale for this study sought to minimize these concerns by evaluating videos that only featured physicians.

A key strength of this study is the use of validated tools (GQS, JAMA, and mDISCERN) to assess video quality and reliability. Additionally, the systematic exclusion of non-English, non-physician-generated, and excessively long videos allowed for a focused analysis of relevant content.

Our findings show that more than half (54.7%) of the reviewed videos were of high quality, and the mean GQS, mDISCERN, and JAMA scores were 3.55±1.06, 3.41±1.17, and 2.62±0.93, respectively.

According to the GQS scores used in our study, 17.8% of the videos were of low quality, 27.4% of them were of medium quality, and 54.7% of them were of high quality.

These results are positive when compared to YouTube video analysis studies conducted in other treatment processes. For example, in a study investigating YouTube videos on psoriasis, the rate of high quality videos was 17% (16). This difference may be due to the fact that we only evaluated videos from physicians in our study. In fact, as in the study of Adorisio et al., the study of Ferhatoğlu et al. found that videos from physicians contained significantly higher information quality than other sources (14,21).

Our average mDISCERN score was found to be 3.41±1.17. This score shows that the videos can be published in an acceptable manner in general. However, the JAMA score of 2.62±0.93 suggests that there is a need for referencing and up-to-dateness processes. Another noteworthy point in our study is the high average number of views (56870±228413) and viewing rate (127.53±319.35) of the videos. This shows that YouTube is widely used as a source of information on a critical issue such as fluid resuscitation. In our current study, the mean VPI was calculated as 37±164.48. This result shows that videos on fluid resuscitation have a relatively limited popularity but a limited overall impact. There are also studies in the literature with high VPI values. For example, in the study by Yurdaisik et al., which included YouTube videos on breast cancer, the mean VPI was reported as 94.10.(24) Similarly, Kuru and colleagues analyzed YouTube videos of rotator cuff tears and calculated the mean VPI to be 90.6 (25). However, contrary to our findings, several studies have reported that YouTube videos uploaded by amateurs are of lower quality, despite having higher like rates and VPI values (26).

There are some limitations to our study. First, only English videos were evaluated, and potential quality content in other languages was excluded. Second, video quality evaluations may vary subjectively, but to minimize this, multiple physician/academic raters and standardized scoring systems were used.

## CONCLUSION

In conclusion, our study shows that physician-based fluid resuscitation videos on YouTube are generally of acceptable quality. Future studies can evaluate content in different languages to obtain more comprehensive results.

**Ethics Committee Approval:** The study is based on video content that has been published publicly on the YouTube platform. Therefore, it is not considered as a study requiring ethical committee approval in accordance with the Declaration of Helsinki and national/international guidelines.

**Informed Consent:** Informed consent was obtained from the participants or their legally authorized representatives.

**Authorship Contributions:** A.H. and B.D. researched literature, conceived the study and wrote the first draft. A.H. and B.D. was involved in protocol development, gaining



ethical approval. A.H., U.K. and B.D. were involved in data acquisition and data analysis. All authors reviewed and edited the manuscript and approved the final version of the manuscript.

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