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Türk Hijyen ve Deneysel Biyoloji Dergisi

Scientific validity and reliability analysis of YouTube videos on hand hygiene in the COVID-19 pandemic

COVID-19 pandemisi döneminde el hijyenine ilişkin YouTube videolarının bilimsel analizi

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ABSTRACT

Objective: As digital platforms are increasingly used to share health information, evaluating the quality of these contents is of critical importance for public health. This study aims to scientifically examine the most watched videos on hand hygiene on YouTube during the COVID-19 pandemic.

Methods: By searching with the keyword "COVID-19 hand hygiene" in January 2025, the 100 most watched videos published during the COVID-19 pandemic period (March 11, 2020 – May 5, 2023) were evaluated. Videos that were shorter than 30 seconds, advertising/propaganda, repetitive, or had poor image quality were excluded. Content was evaluated by two independent researchers using the DISCERN scale and JAMA criteria.

Results: The total number of views of the videos was over 200 million; the average duration was 6.8±4.2 minutes. 76.4% of the content was general information, 11.8% was hands-on demonstration, 8.2% was misinformation correction, and 4.6% was product promotion. The mean DISCERN score was 45.8±10.6; 20% of the videos were categorized as "excellent",

ÖZET

Amaç: Dijital platformların sağlık bilgisi paylaşımında giderek daha sık kullanıldığı günümüzde, bu içeriklerin kalitesinin değerlendirilmesi halk sağlığı açısından kritik öneme sahiptir. Bu çalışma, COVID-19 pandemisi sırasında YouTube'da el hijyeni ile ilgili en çok izlenen videoların bilimsel incelemeyi amaçlamaktadır.

Yöntem: Ocak 2025'te "COVID-19 hand hygiene" anahtar kelimesi ile arama yapılarak, COVID-19 pandemi döneminde (11 Mart 2020 – 5 Mayıs 2023) yayınlanmış olan ve en çok izlenen 100 video değerlendirilmiştir. Otuz saniyeden kısa olan, reklam veya propaganda içeren, tekrar eden ya da düşük görüntü kalitesine sahip videolar çalışma dışı bırakılmıştır. İçerik, iki bağımsız araştırmacı tarafından DISCERN ölçeği ve JAMA kriterleri kullanılarak değerlendirilmiştir.

Bulgular: Videoların toplam izlenme sayısı 200 milyonun üzerindeydi; ortalama süre 6,8±4,2 dakika olarak hesaplandı. İçeriklerin %76,4'sı genel bilgi, %11,8'si uygulamalı gösterim, %8,2'i yanlış bilgi düzeltmesi ve %4,6'ü ürün tanıtımıydı. Ortalama DISCERN skoru

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18% as “good”, 34% as “fair”, 20% as “poor” and 8% as “very poor”. The DISCERN score of health professional videos (52.4±8.2) was significantly higher than that of individual user videos (39.6±7.8) (p<0.001). The mean JAMA score was 2.6±0.7, and the citation criterion had the lowest fulfillment rate (28.0%). Additionally, a weak positive correlation was found between video duration and quality (p=0.41; p<0.001). However, there was no significant relationship between the number of views, likes or comments and video quality.

Conclusion: During the COVID-19 pandemic, the overall scientific quality of YouTube videos on “COVID-19 pandemic and hand hygiene” is insufficient. Content produced by healthcare professionals and official institutions is more reliable. To protect public health, the visibility of reliable videos should be increased, digital health literacy should be strengthened, and users should be guided correctly in accessing information.

Key Words: COVID-19, hand hygiene, consumer health information, social media

45,8±10,6 idi; videoların %20’si “mükemmel”, %18’i “iyi”, %34’ü “orta”, %20’si “zayıf” ve %8’i “çok zayıf” kategorisinde yer aldı. Sağlık profesyoneli kaynaklı videoların DISCERN skoru (52,4±8,2), bireysel kullanıcı videolarına (39,6±7,8) göre istatistiksel olarak anlamlı derecede daha yüksekti (p<0,001). Ortalama JAMA skoru 2,6±0,7 olup, en düşük karşılanma oranı atıf kriterinde (%28) saptandı. Ayrıca video süresi ile kalite arasında pozitif yönde zayıf bir korelasyon bulundu (p=0,41; p<0,001).

Sonuç: COVID-19 döneminde YouTube’daki “COVID-19 pandemi dönemi ve el hijyeni” videolarının genel bilimsel kalitesi yetersizdir. Sağlık profesyonelleri ve resmî kurumlar tarafından üretilen içerikler daha güvenilirdir. Halk sağlığının korunması için güvenilir videoların görünürlüğü artırılmalı, dijital sağlık okuryazarlığı güçlendirilmeli ve kullanıcıların bilgiye erişimde doğru yönlendirilmesi sağlanmalıdır.

Anahtar Kelimeler: COVID-19, el hijyeni, tüketici sağlık bilgisi, sosyal medya

INTRODUCTION

The COVID-19 pandemic has once again demonstrated the critical role of hand hygiene in the prevention of infectious diseases worldwide. The World Health Organization (WHO) has recommended hand washing as one of the main measures to reduce the spread of SARS-CoV- 2 (1). Hand hygiene, which is a simple and low-cost practice, is an effective method in both protecting public health and preventing nosocomial infections in healthcare services (2,3).

During the pandemic, digital media has become an important tool in public health communication. YouTube is one of the most frequently used platforms in search of health information thanks to the easy accessibility and widespread use of visual content (4). Its user-friendly structure and free access have made YouTube a source of information for both professionals and community members (5). However, due to the unregulated nature of the platform, the scientific accuracy and reliability of the content is questionable. Inaccurate or incomplete information may lead individuals to misapply with protective measures and increase public health risks (6,7).

In recent years, various analyses have been conducted on the quality of medical content on YouTube, and it has been shown that the information provided on topics such as cancer, vaccination and

infectious diseases is often inadequate, misleading or incompatible with scientific guidelines (8,9). However, there is limited research on the scientific validity and reliability of videos on hand hygiene during the COVID-19 pandemic. This situation reveals the necessity to examine the quality of information on an issue of critical importance in terms of public health.

In this study, we scientifically evaluated hand hygiene videos published on YouTube during the COVID-19 pandemic. The aim of the study was to reveal the current potential and limitations of digital public health education by analyzing their accuracy and compliance with medical guidelines.

MATERIAL and METHOD

Video Selection

By searching with the keyword "COVID-19 hand hygiene" in January 2025, the 100 most watched videos published during the COVID-19 pandemic period (March 11, 2020 – May 5, 2023) were evaluated. The results obtained were listed with the "ranking by number of views" filter and the first 100 most watched videos were evaluated. Only English videos were included in the study. Videos for advertising/propaganda purposes, repetitive videos, videos with poor sound or image quality and videos shorter than 30 seconds were determined as exclusion criteria. Finally, 100 videos were included in the analysis.

Data Collection

IThe main characteristics of the videos were systematically recorded: Upload date and upload source, Total number of views, likes and comments, Video duration, Daily viewership (total views divided by the number of days on air). Video upload sources are divided into three categories: Health professionals (physicians, nurses, specialized health workers), Official institutions and health organizations (Ministry of Health, WHO, universities, associations), Individual users and media channels.

Content Evaluation

The scientific analysis of the videos was verified by a single researcher who reviewed them twice.

DISCERN Scale: It is a 15-item tool that assesses the reliability of health knowledge about treatment and prevention methods. Each item was scored between 1-5 and the total score was calculated between 15-75. The obtained scores were categorized as "very poor" (<27), "poor" (27-38), "fair" (39-50), "good" (51-62) and "excellent" (63-75) (10).

JAMA Benchmark Criteria: Evaluates authorship, citation, description and timeliness criteria. A score of 1 was given for each criterion, and the total score ranged from 0 to 4 (11).

The evaluations were made independently, and in case of differences, the opinion of the third investigator was obtained, and a consensus was reached. Inter-rater reliability was measured by Cohen's kappa coefficient (4,12).

IBM SPSS 25.0 (IBM Corp., Armonk, NY, USA) was used for data analysis. Continuous variables are presented as mean ± standard deviation and median (minimum-maximum) and categorical variables are presented as number and percentage. Differences between groups were analyzed by Kruskal-Wallis test and pairwise comparisons were analyzed by Mann-Whitney U test. Chi-square test was applied for categorical variables. The relationship between the number of views and quality scores was evaluated by Spearman correlation. $p<0.05$ was considered statistically significant.

Since there were no human participants or experimental interventions in the study and the content analyzed was publicly accessible, ethics committee approval was not required (4).

Since the study did not involve human participants, patient data, or experimental interventions and only analyzed publicly accessible YouTube content, approval from an ethics committee was not required. The research was carried out in accordance with ethical principles and academic integrity standards.

RESULTS

The total number of views of the 100 most viewed videos included in the study was 201071700 and the average number of views was 2,010,717± 11,233,109.24. The average duration of the videos was 6.8±4.2 minutes (min - max: 0.6 - 24.5 minutes), the average number of likes was 12,340±25,670, and the average number of comments was 854±1,246. The average time the videos were online was 720±380 days.

Video Sources

Of the videos, 40.0% were uploaded by healthcare professionals (n=40), 32.0% by government agencies and healthcare organizations (n=32), and 28.0% by individual users or media channels (n=28). Although the number of videos produced by health professionals was higher than that of official institutional videos (p=0.044), individual user videos had the highest rate of likes/views.

Content Characteristics

Of the videos, 76% contained general information (hand washing time, soap use, disinfectant efficacy), 12% contained hands-on demonstrations, 8% contained myth/misinformation corrections, and 4% contained product promotion. Videos with practical demonstrations were evaluated higher in terms of DISCERN scores than other categories (p=0.013).

DISCERN Evaluation

The mean DISCERN total score of the videos was 45.8±10.6 (Table 1). The mean DISCERN score of the health professional videos (52.4±8.2) was significantly higher than that of the individual user videos (39.6±7.8) (p<0.001). The distribution of DISCERN score categories among the analyzed videos is presented in Figure 1.

JAMA Benchmark Results

The mean score according to JAMA criteria was 2.6±0.7. While only 12% of the videos met all criteria, the most frequently missing dimension was “citation/referencing”. While the timeliness criterion was high in videos uploaded by healthcare institutions (91%), this rate remained at 39% in individual user videos. The fulfillment rates of the JAMA benchmark criteria by the analyzed videos are illustrated in Figure 2.

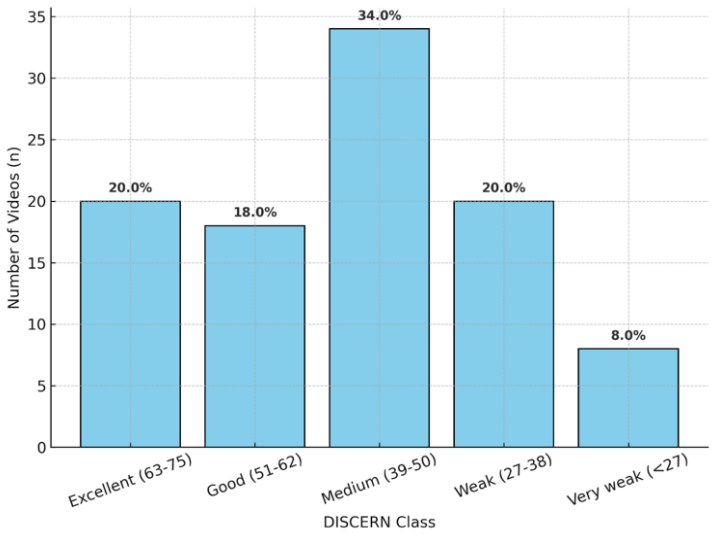

Figure 1. DISCERN Score Distributions

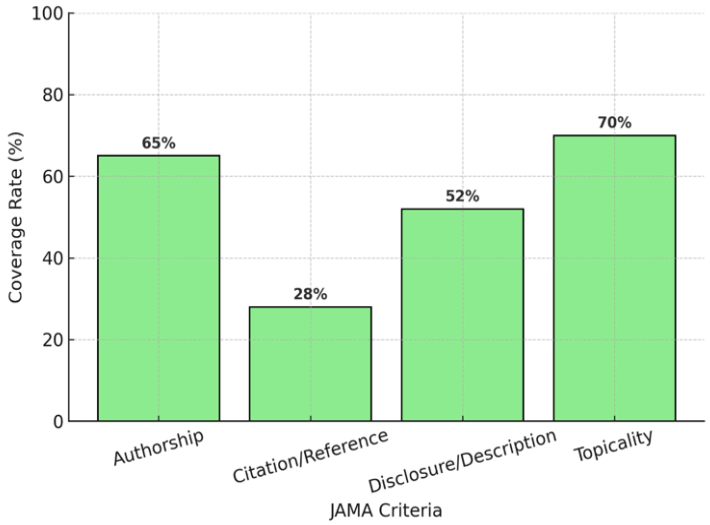

Figure 2. Coverage rates of JAMA benchmark criteria among the analyzed YouTube videos

Correlation Analysis

A weak correlation ($r=0.41$, $p<0.001$) was found between video duration and DISCERN score. However, there was no significant relationship between the number of views, likes or comments and video quality ($p>0.05$) (Table 1).

There was no strong correlation between quantitative measures of popularity (views, likes, comments) and content quality among the most viewed videos. Health professionals and government agency videos scored higher on scientific validity. In contrast, although individual user videos reached a large audience, content reliability was found to be low.

Table 1. Spearman Correlations

Variable 1	Variable 2	Spearman ρ	p
Duration (min)	DISCERN	0.543	<0.001
Tracking	DISCERN	-0.011	0.9147
Likes	DISCERN	0.12	0.2332
Comment	DISCERN	0.065	0.5182
Daily views	DISCERN	0.034	0.7373

DISCUSSION

This study analyzed the 100 most viewed YouTube videos on hand hygiene during the COVID- 19 pandemic to determine their scientific accuracy and reliability. The findings show that a significant proportion of YouTube content on a public health-critical topic is scientifically inadequate and lacks attribution. The higher quality scores of videos produced by health professionals and official institutions emphasize the decisive role of authoritative sources in the dissemination of reliable information. In contrast, the limited number of scientific citations in videos uploaded by individual users or media outlets is noteworthy.

Hand hygiene has emerged as one of the most fundamental protective measures to prevent transmission of SARS-CoV-2. The World Health Organization (WHO) repeatedly emphasized the critical role of hand washing in breaking the chain of transmission during the pandemic and shared educational materials on this subject online (12). However, misinformation spread rapidly during the pandemic, especially through social media, making it difficult for individuals to adopt correct health behaviors (4,6). In our study, it was found that only one-third of the videos showed references, and the citation criterion had the lowest rate of fulfillment among the JAMA criteria. This situation limits the chance for users to independently verify information and opens the door to malpractice.

Previous research has highlighted similar problems with many of the health videos on YouTube. Reviews in different fields such as cancer treatment (8), cardiovascular diseases (13), immunization (9) and dermatology (7) have revealed that a significant proportion of videos contain information that is incomplete, outdated or inconsistent with medical guidelines. Our findings are in line with this literature and show that content produced by professional sources is indispensable in terms of access to reliable information, especially in a critical issue for public health such as hand hygiene.

In our study, a positive correlation was found between video duration and quality scores. Longer videos had higher DISCERN scores, suggesting that comprehensive content is stronger in terms of scientific accuracy. However, it is also emphasized that optimum duration is important in terms of maintaining viewer's attention. In the literature, it has been reported that a 5-10-minute interval is ideal for educational health videos, and attention loss may occur in longer videos (14). Recent studies further support this by showing that shorter videos may be more effective in sustaining viewers' attention, while excessive exposure to short-form content can negatively impact overall attention span (15). In this context, it appears that content producers should develop materials that are both comprehensive and audience friendly.

On the other hand, no significant relationship was found between video popularity measures (views, likes, comments) and quality scores. This finding suggests that highly viewed videos do not always provide reliable content and that popularity does not necessarily correlate with quality. Similarly, studies on COVID-19 and other infectious diseases reported that most of the videos that went viral were of low quality (16,17). This situation reveals that individuals should not evaluate content based solely on popularity indicators and that improving health literacy is critical.

According to DISCERN classification, a significant portion of the videos were in the "moderate" or "poor" category. This indicates a serious gap in public health. Inaccurate or incomplete information can directly negatively affect the hygiene behaviors of the community under pandemic conditions. Therefore, increasing the content prepared by official institutions, professional associations and health professionals and making these videos more visible are important to protect public health (18,19). Recent studies also highlight the need for systematic approaches, including machine learning methods, to curate reliable COVID-19 videos on YouTube and improve public health literacy (20).

Our findings indicate that a considerable proportion of hand hygiene videos on YouTube during the COVID-19 pandemic were of low or moderate quality. This situation not only reflects an academic concern but also has significant implications for public health and policy. Health authorities, professional associations, and official institutions should play a more active role in digital health communication by producing scientifically accurate content and ensuring its visibility through official channels. In addition, collaborations with digital platforms could be developed to promote reliable information and reduce the spread of misleading content. Strengthening such measures will contribute to protecting community health and building public trust in health information.

Limitations of our study should be considered. First, the analysis only covers the YouTube platform, whereas other social media channels such as TikTok, Instagram and Facebook are also widely used as sources of health information. Second, the lack of data on audience profile (age, education level, health literacy) limits the ability to assess the actual impact of the content. Finally, only DISCERN and JAMA criteria were used and factors such as visual presentation quality or cultural relevance were not assessed

In conclusion; this study assessed the content and credibility of the 100 most viewed videos on YouTube about hand hygiene during the COVID-19 pandemic. The findings showed that videos produced by health professionals and government agencies were more scientifically credible, but overall, a significant proportion of the content was of low or moderate quality. Furthermore, video popularity (number of views, likes, comments) was not associated with content quality.

The results suggest that social media content on public health issues should be carefully evaluated, and the visibility of reliable sources should be increased. Health professionals, academic institutions and authorities should produce and make accessible more digital content to accurately communicate hand hygiene and similar critical health behaviors to the public.

Moreover, it is important to develop digital health literacy so that individuals can critically evaluate online health information. In this respect, it is critical for both content producers to observe quality standards and health authorities to take a more active role in online platforms to ensure access to accurate information in similar global health crises in the future.

Future research could extend this analysis by including other social media platforms such as TikTok, Instagram, or Facebook. In addition, cross-language and cross-cultural comparisons may provide further insight into how health information is disseminated and perceived in different contexts.

ETHICS COMMITTEE APPROVAL

* This study does not require Ethics Committee Approval.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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