Assessment of information on YouTube on the effect of acupuncture in patients with COVID-19: A cross-sectional study

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Abstract
Medical-related information rapidly spreads throughout the internet. However, these types of information often contain inaccurate information, which can lead to harmful misconceptions. In this study, we evaluated the reliability, quality, and accuracy of videos uploaded on YouTube that harbor claims on the effects of acupuncture on COVID-19 treatment. This is a cross-sectional study. Videos uploaded on YouTube up to February 17, 2022, were searched, and the keywords used were as follows: “acupuncture,” “coronavirus,” “COVID-19,” “Corona,” “COVID,” and “SARS-CoV2.” The top 50 videos in English were viewed and evaluated. The reliability of the videos was evaluated using the modified DISCERN scale, the content-quality was evaluated using the Global Quality Scale. The accuracy of the information in each video was evaluated as well. Of the 50 videos, only 8% were found to be reliable and 64% were of poor quality. Additionally, 98% of the videos were misleading. The mean modified DISCERN scores was 1.72 and the mean Global Quality Scale score was 2.06. Despite the videos being made by experts, their reliability, content-quality, and accuracy were found to be low. The spread of inaccurate information may result in the use of inappropriate and potentially harmful treatment methods for patients. Videos that contain medical information should be produced based on verified scientific evidence.

Keywords: access to information, acupuncture, COVID-19, Internet

1. Introduction
After the first confirmed case of coronavirus disease (COVID-19) in December 2019 in China, COVID-19 rapidly spread worldwide in a span of 2-3 months. As of 2022, the situation continues and the number of deaths continue to rise. Although vaccines against COVID-19 have been developed, it continues to spread owing to the emergence of variants. Patients with COVID-19 present with various symptoms including fever, chills, dyspnea, cough, diarrhea, headache, dizziness, and chest pain. Approximately, 80% of patients with COVID-19 have mild symptoms, and symptomatic treatment is used for these cases. However, 10% to 20% of patients develop severe pneumonia, and hospitalization and intensive care are required to reduce mortality. To treat COVID-19, various supportive management strategies and medications have been applied. However, no specific medications for treating COVID-19 have been developed.

Acupuncture is known to enhance immune function and exert anti-inflammatory effects. Acupuncture can help manage the symptoms associated with various diseases or illnesses. Effective management of the symptoms of COVID-19 using acupuncture has been proposed. However, to date, no clinical trials have been conducted to evaluate the effect of acupuncture in controlling COVID-19 symptoms. Only a few case reports have described the beneficial therapeutic effects of acupuncture in the treatment of COVID-19. Therefore, evidence regarding the effects of acupuncture on COVID-19 is lacking.

With the Internet, individuals can now easily access medical information online and learn which medical services are appropriate. People seek advice from medical experts and listen to other patients’ experiences through social media. However, medical information available in online multimedia platforms are not always accurate, which may result in incorrect and potentially harmful health decisions from patients. YouTube, the most popular and largest online media-sharing platform, is considered the most important online platform for disseminating medical information.

In this study, we evaluated the reliability, content-quality, and accuracy of the most frequently viewed YouTube videos that contain information on the effects of acupuncture on COVID-19.
2. Material and Methods

2.1. Video selection

The video included in this cross-sectional study was searched on https://www.youtube.com/ on February 17, 2022, using the following keywords: “acupuncture,” “coronavirus,” “COVID 19,” “COVID-19,” “Corona,” “COVID,” and “SARS-CoV2.” The YouTube setting was “Global” and no other search filters were used, except that to sort views in descending order. The video selection criteria were as follows: a video that contains information on the effect of acupuncture for COVID-19 treatment and a video that uses English language as a medium. The exclusion criteria were as follows: off-topic videos such as a hospital or a clinic promotional and video that contains no audio. The 50 most-viewed videos fulfilling these criteria were included in this review. This study did not require ethics committee approval, as it did not involve human participants and the videos were publicly accessible.

2.2. Data extraction

We extracted the data from each video. The data included the title, production source, duration of upload on YouTube, video length, and total number of views, likes, and subscribers of the uploader. The video production source was categorized as hospital or professional (hospital or treatment clinic, or a professional such as a clinician), television or Internet-based news or programs, or videos by patients (clips uploaded by an individual without any professional affiliation).

2.3. Assessment of reliability, content-quality, and accuracy

The reliability of the video content was assessed using the modified DISCERN (mDISCERN) scale, adapted from the original DISCERN for the assessment of written health information by Charnock et al.[14] The mDISCERN scale includes the following 5 questions: Are the aims clear and achieved?; Are reliable sources of information used?; Is the information presented balanced or unbiased?; Are additional sources of information listed for patient reference?; and Are areas of uncertainty mentioned? The higher the mDISCERN score, the higher is the reliability of the video content. For the mDISCERN, a score of 3 or more and that <2 was considered reliable and unreliable, respectively.

The Global Quality Scale (GQS) was used to evaluate the overall content-quality of video content.[15] This evaluation tool was originally developed to assess website resources and evaluate the flow and ease of use of the information present online. The content-quality of information can be classified using the GQS as follows: poor quality, poor flow, most information missing, hence unhelpful; generally poor quality and poor flow, some information listed but many important topics missing, hence of very limited use; moderate quality, suboptimal flow, and some important information is adequately discussed; good quality and generally good flow, and most relevant information is listed, hence useful; and excellent quality and excellent flow, hence very useful. A higher GQS score indicates a greater content-quality of information.

Each video was classified as accurate, misleading, or both inaccurate and misleading. If the video does not contain any incorrect scientific statement, it was classified as an accurate video, and if it contained at least 1 incorrect scientific statement, it was classified as a misleading video. If the videos had no scientific information, they were considered both inaccurate and misleading. Two reviewers (Y.J.C. and M.C.C.) evaluated the reliability, content-quality, and accuracy of the selected videos, and any discrepancies in assessment were discussed until consensus was reached.

2.4. Statistical analysis

Statistical Product and Service Solutions, version 22 (IBM, Armonk, NY, USA) was used for statistical analysis. The Mann–Whitney U test was used to evaluate statistically significant differences in the general features and assessment results of the videos of the groups categorized according to the production sources. In addition, the Mann–Whitney U test was used to compare videos with mDISCERN scores ≥3 and <3, between videos with moderate to excellent quality (GQS ≥3) and poor quality (GQS <3), and between accurate videos and misleading videos. Statistical significance was set at P value of <0.05.

3. Results

Of a total of 144 videos, 50 that met the selection criteria were selected for review (Fig. 1). The general features (production source, duration of upload on YouTube, video length, and total number of views, likes, and subscribers of the uploader) and assessment results (mDISCERN and GQS scores) of the selected videos are presented in Table 1. The web address, titles of the included videos on YouTube, and detailed data are presented in Supplementary 1, Supplemental Digital Content 1, http://links.lww.com/MD/H222. Of the 50 videos, 44 were produced by hospitals or professionals, 5 by television or internet-based news or programs, and 1 by a patient. The average mDISCERN score for the included 50 videos was 1.72 ± 0.76. Of these videos, only 16% (n = 8) contained highly reliable information (≥3 mDISCERN). The distribution of the videos according to mDISCERN scores was as follows: 5 points, n = 0; 4 points, n = 0; 3 points, n = 8; 2 points, n = 21; 1 point, n = 20; and 0 point, n = 1. Regarding the assessment of information quality, the average GQS score of the included videos was 2.06 ± 0.82, and the video distribution according to the GQS score was as follows: score 1, n = 15; score 2, n = 17; score 3, n = 18; score 4, n = 0; score 5, n = 0. In addition, only 1 video was classified as accurate, and the remaining 49 videos were classified as misleading.

The videos were compared using the Mann–Whitney U test for general characteristics by production source. The videos were analyzed by dividing them into videos produced by experts (hospital and professional) and videos produced by non-experts (television- or Internet-based news or programs, and patients). The length of videos produced by experts were significantly longer than those produced by non-experts (P = .01) (Table 2). The number of subscribers of the uploader was lower among videos produced by experts than for those produced by non-experts (P = .01). The GQS score was higher for videos produced by experts than for those produced by non-experts (P = .01). However, there were no significant differences regarding duration of upload on YouTube (P = .45), number of views (P = .22), number of likes (P = .28), mDISCERN score (P = .37), and accuracy (P = .76).

The Mann–Whitney U test analysis of videos with mDISCERN scores ≥3 and <3 did not show a significant difference regarding the duration of upload on YouTube (P = .65), video length (P = .99), number of views (P = .73), number of likes (P = .71), and number of subscribers of the uploader (P = 1.00) (Table 3). In addition, the Mann–Whitney U test analysis of videos with moderate to excellent quality (GQS ≥3) and poor quality (GQS <3) did not show a significant difference in the number of views (P = .27) or the number of subscribers of the uploader (P = .58). However, in videos with GQS <3, the duration of upload on YouTube was longer (P = .003) and the number of likes was higher (P = .03) than in videos with GQS ≥3. The video length was longer for GQS ≥3 (P < .001). In the comparison between accurate videos and misleading videos, no significant difference was observed using the Mann–Whitney U test (duration of upload on YouTube, P = .40; video length, P = .96; number of views, P = .16; number of likes, P = .30; number of subscribers of the uploader, P = .35) (Table 3).

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4. Discussion

Our study reviewed the top 50 videos on the effectiveness of acupuncture in the treatment of COVID-19. Of these, 92% were found to be unreliable, 64% were of poor quality, and 98% were misleading. Therefore, there are serious concerns regarding the reliability, content-quality, and accuracy of the 50 most-viewed videos on YouTube regarding the effectiveness of acupuncture on COVID-19.

To date, previous studies have shown that acupuncture helps improve the symptoms of viral pneumonia,[7,11] however, there are no systematically designed clinical studies implemented on the question of effectiveness of acupuncture on COVID-19 treatment. Only a few case reports have reported on the positive therapeutic
effects of acupuncture for COVID-19 patients, and most studies other than case reports contain only theoretical statements or assumptions that acupuncture might be effective in controlling symptoms of COVID-19. To demonstrate the effectiveness of acupuncture for COVID-19 patients, and most studies of acupuncture in treating symptoms of COVID-19, prospective randomized clinical trials with control or placebo groups are necessary. Owing to a lack of evidence, it is difficult to judge whether acupuncture is suitable for the treatment of COVID-19. Accordingly, statements or conclusions that acupuncture is effective against COVID-19 are incorrect or misleading. Among the videos included in our study, only 1 video contained accurate information that was based on research papers and books, and the remaining 49 videos included information that was at risk of biased content such as anecdotal information or information that lack sufficient scientific evidence. More than half of the included videos were considered unreliable and of poor quality. Biased, inaccurate, or poor-quality videos can mislead audiences and its platform is continuously growing. Therefore, sharing medical information through YouTube is becoming more common, and as this has become an important information delivery system for viewers, uploaders need to thoroughly review video content based on scientific facts to provide accurate information. Furthermore, as YouTube is not the sole source of medical information, it is necessary to acknowledge that individuals who perform YouTube searches to obtain information may be exposed to inaccurate information. In order to overcome this issue, it may be necessary to accompany such searches with a search for research articles, books, or news articles based on scientific studies. Our study included only the top 50 videos with the most views based on a search involving a limited number of keywords. Viewers should not believe the videos unconditionally and must verify the accuracy of the information through consultation with professionals or verified scientific facts.

### 5. Conclusion

In conclusion, the 50 most viewed videos in YouTube that contain information on the effect of acupuncture on COVID-19 treatment, including those produced by hospitals and professionals, had low reliability, content-quality, and accuracy. Recently, YouTube has become more accessible than TV or newspapers, and its platform is continuously growing. Therefore, sharing medical information through YouTube is becoming more common, and as this has become an important information delivery system for viewers, uploaders need to sufficiently review video content based on scientific facts to provide accurate information. Furthermore, as YouTube is not the sole source of medical information, it is necessary to acknowledge that individuals who perform YouTube searches to obtain information may be exposed to inaccurate information. In order to overcome this issue, it may be necessary to accompany such searches with a search for research articles, books, or news articles based on scientific studies. Our study included only the top 50 videos with the most views based on a search involving a limited number of keywords. Viewers should not believe the videos unconditionally and must verify the accuracy of the information through consultation with professionals or verified scientific facts.
to search for videos on acupuncture treatments for COVID-19. Also, our study is limited in that the reliability, content-quality, and accuracy of the videos were evaluated subjectively. Further studies addressing these limitations are warranted.

Author contributions
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All authors have read and agreed to the published version of the manuscript.

Correction
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