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SOCIAL MEDIA ETHICS OBSERVATIONAL RESEARCH

ANALYSIS OF YOUTUBE VIDEOS ON PULMONARY REHABILITATION IN COVID-19

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Abstract

Introduction: YouTube is a popular social media platform frequently searched by online users for retrieving health-related information. Pulmonary rehabilitation programs have an important place in the COVID-19 treatment protocols. The aim of this study was to evaluate COVID-19 pulmonary rehabilitation videos on YouTube.
Methods: A total of 180 videos tagged with the search terms "COVID-19 pulmonary rehabilitation", "COVID-19 pulmonary exercise" and "COVID-19 pulmonary physiotherapy" were retrieved. Of these, 63 videos met the study inclusion criteria. The Global Quality Scale (GQS) and the modified DISCERN tool were performed for quality and reliability assessments. Duration of video, upload date, number of views, likes, dislikes, and comments were recorded. Video sources were determined.
Results: Of the total 63 videos, 22 (34.9%) were classified in the high-quality group, 19 (30.2%) intermediate quality group, and 22 (34.9%) low quality group. The main sources of the high-quality videos were universities and physicians. Others, patients, independent users and health related websites produced high rates of low-quality videos. No significant difference was detected in views, likes, dislikes, and comments per day between the quality groups ($p > 0.05$).
Conclusion: Numbers of high, intermediate and low-quality videos were very close to each other. It is necessary to consider the video sources in order to find videos that contains accurate information. Video parameters other than sources should not be considered as quality indicators.

Keywords: Social Media, YouTube, COVID-19, Pulmonary Rehabilitation, Pulmonary Exercise, Pulmonary Physiotherapy
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INTRODUCTION

Defined by the World Health Organization (WHO) as Coronavirus Disease 2019 (COVID-19), the disease is a respiratory infection that rapidly spreads worldwide and poses a global public health issue [1]. Since various respiratory affections are diagnosed in patients with COVID-19, pulmonary rehabilitation becomes critically important in this group of patients [2]. Psychological support and behavioral and nutritional advice are often required to complement various exercise programs [3].
In the time of the COVID-19 pandemic, the Internet has become the main platform for information retrieval [4]. YouTube, an online video-sharing platform, has gained an utmost importance during the same period, along with other social media channels [5]. With Google listed first, YouTube is ranked as the second globally popular website [6].

YouTube has several advantages as a source of health information. Its videos are publicly available for views and downloads. There are, however, concerns over the accuracy and quality of information on this channel since posted videos do not pass the traditonal peer review and quality checks [7]. YouTube parameters such as views, likes, and dislikes may not convey the right message to online users who seek accurate information. As such, some videos may contain incorrect and misleading information that can be rapidly disseminated with negative consequences.

To date, there are no studies evaluating COVID-19 pulmonary rehabilitation videos on YoutTube. Given the exponential growth of COVID-19 cases worldwide and restricted access to health institutions, online users may increasingly consult easily available sources of health information such as those on social media channels.
The aim of this observational study was to assess the quality of COVID-19 pulmonary rehabilitation videos and to distinguish the most accurate and reliable materials on YouTube

MATERIALS AND METHODS

For this observational analysis, we employed the following search terms: “COVID-19 pulmonary rehabilitation”, “COVID-19 pulmonary exercise”, and “COVID-19 pulmonary physiotherapy”. The search for video materials was performed on YouTube (http://www.youtube.com) on March 4th, 2021. The browser history was erased prior to the current search to avoid the influence of the previously watched videos. It is well known that most users pay attention to the initial three records of the retrived video lists (20 videos per page and 60 videos in total) [8, 9].

The current video sampling method was similar to that described elsewhere [10, 11, 12]. A total of 180 video links were retrieved by utlizing the three search terms. Irrelevant, repetitive, poorly accessible, and non-English videos were excluded from the evaluation process.

Two researchers (BFK and AA) independently evaluated the overall quality. The Global Quality Scale (GQS) with rating between 1 to 5 was used [13, 14, 15]: 1 point represents the lowest quality (video quality and flow are very poor, information is obviously lacking, and it is not beneficial to users) and 5 point represents the highest quality (video quality and flow are excellent, very beneficial for users). Three groups of video were formed based on the GQS scores: high (4 or 5 points), intermediate (3 point), and low-quality (1 or 2 points). Videos with an inconsistency between the scores of the two independent researchers were detected. These videos were evaluated by a third researcher (ARS) without their knowledge of previous scores, and final decision was made.

Reliability assessment was carried out using The modified DISCERN tool (DS) [16]. DS was created by shortening the original version; it contains five yes/no questions. Whether the video is clear, short and understandable; reliable sourcing status; the state of the information being balanced and impartial; the status of listing additional sources of information and addressing areas of uncertainty/controversy are evaluated. Yes answer is defined as 1 point, no answer is defined as 0 point. Increasing scores indicate greater reliability.

The duration of video, upload date, view, like, dislike, and comment data were obtained from YouTube platform. The values of views, likes, dislikes and comments per day were calculated in order to minimize the effect of the upload date.

The sources were categorized into the following headings: Physician, non-physician health personnel, health-related website, patient, university, professional organization/association, independent user, and others.

STATISTICAL ANALYSES

The data obtained from the YouTube platform were processed using the Statistical Package for the Social Sciences version 20.0 package program (SPSS Inc., Chicago, IL, USA). The data were reported as number, percentage, and median (minimum - maximum). Distribution of all parameters was checked by Shapiro-Wilk test. Kruskal-Wallis test was used for comparisons between the three quality groups (high, intermediate,

and low). Kappa coefficient was calculated in order to evaluate whether the consistency between the scores of the two researchers was sufficient. The significance level was set at $p < 0.05$.

RESULTS

Following the inclusion and exclusion procedures, 63 videos were remained for the analyses. Of these, 22 (34.9%) were classified in high-quality, 19 (30.2%) intermediate-quality, and 22 (34.9%) low-quality groups (Figure 1). The general characteristics of the videos are summarized in Table 1. The Kappa score used to examine inter-rater agreement is 0.83.

Figure 1. Flowchart showing the selection of YouTube videos

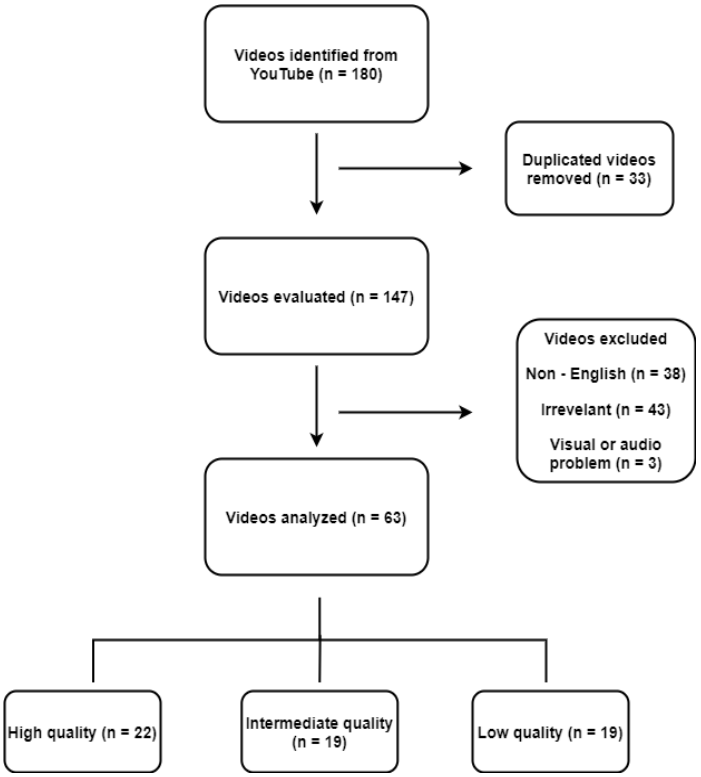

Table 1. General features of the evaluated videos

Video features	Median (minimum-maximum)
Duration (seconds)	576 (110 - 5479)
Number of views	4261 (227 - 819140)
Number of likes	85 (0 - 11000)
Number of dislikes	1 (0 - 459)
Number of comments	2 (0 - 561)

n: number, %: percentage

When the videos were analyzed according to their source, 24 (38.1%) were sourced from non-physician health personnel, 14 (22.2%) from phsicians, 7 (11.1%) from professional organizations/associations, 6 (9.5%) from universities, 3 (4.8%) from health-related websites, 3 (4.8) from independent users, 1 (1.6%) from patients, and 5 (7.9%) from others.

The main sources of high-quality videos were universities and physicians. Low-quality videos were mainly sourced from others, patients, independent users, and health related websites (Table 2).

Table 2. Categorization of videos according to their sources, n (%)

Source	High quality	Intermediate quality	Low quality	Total
Physician	8 (57.1)	5 (35.7)	1 (7.2)	14
Non physician health personnel	7 (29.2)	8 (33.3)	9 (37.5)	24
Health related website	0 (0)	1 (33.3)	2 (66.7)	3
University	5 (83.3)	1 (16.7)	0 (0)	6
Organization/association	2 (28.6)	3 (42.8)	2 (28.6)	7
Patient	0 (0)	0 (0)	1 (100)	1
Independent user	0 (0)	1 (33.3)	2 (66.7)	3
Other	0 (0)	0 (0)	5 (100)	5

Significant difference was detected in DS scores among the quality groups ($p < 0.001$), and highest scores were in the high-quality group. On the other hand, no significant difference was found in views, likes, dislikes, and comments per day between the groups (Table 3).

Table 3. Comparison of DS and video parameters between the high, intermediate and low-quality groups

Video quality	DS[a] Median (min-max)	Views per day[b] Median (min-max)	Likes per day[c] Median (min-max)	Dislikes per day[d] Median (min-max)	Comments per day[e] Median (min-max)
Low	2 (1-3)	30.53 (0.88-1051.25)	0.37 (0-19.4)	0.01 (0-0.49)	0.03 (0-1.55)
Mid	3 (2-5)	18.28 (1.46-812.11)	0.41 (0.04-16.98)	0.01 (0-0.28)	0 (0-0.65)
High	4.5 (3-5)	11.13 (0.87-2388.16)	0.2 (0-32.07)	0.01 (0-1.34)	0.01 (0-1.64)

a: $p < 0.001$ b: $p = 0.794$ c: $p = 0.662$, d: $p = 0.462$ e: $p = 0.115$

DS: Modified DISCERN Tool, min: minimum, max: maximum

DISCUSSION

In the digitalized world, individuals increasingly use online resources to make health-related decisions. YouTube is a social media platform that may disseminate openly accessible health-related information. As a free and easily accessible platform, YouTube attracts numerous users worldwide. On the other hand, the lack of expert evaluation filters on the platform may result in the dissemination of misleading and inaccurate information [17].

The aim of our analysis was to evaluate COVID-19 pulmonary rehabilitation videos on YouTube. Such analysis is especially important in view of the uncertainrties and difficulties of obtaining first-hand information in health institutions. We observed a balanced distribution of videos in predefined quality groups. The major sources of high-quality videos were universities and physicians whereas low-quality videos were sourced from others, patients, independent users, and health-related websites. Of the analyzed videos, 22 (34.9%) were in the high-quality, 19 (30.2%) in the intermediate-quality, and 22 (34.9%) in the low-quality groups. A wide range of percentages of high-quality, or useful, YouTube videos has been reported elsewhere. Some studies have reported high-quality percentages of about 50% [6, 10, 18]. Lower percentages of these videos were also reported [19, 20].

Several factors may confound the observed quality variations in the published literature. First of all, YouTube studies are heterogenous. Some topics covered by YouTube might be associated with high-quality information on a topic while others not. Video sources may influence the quality. The evaluations can be subjective and vary across researchers. Inclusion and exclusion criteria, language and sample sizes may differ. Our results suggest that YouTube presents high-quality and useful information mixed with misleading and inaccurate information. Importantly, over half of the videos in our study were sourced by non-physician health personnel and physician. The main sources of high-quality videos were universities and physicians. Others, patients, independent users and health-related websites mainly produced low-quality videos. High-quality video sources are compatible with previous studies. Kocyigit et al. [8] and Tolu et al. [10] reported that universities and physcians as the major sources of high-quality videos. Bora et al. [21] evaluated videos on Zika virus pandemic and considered universities as the main source of high-quality videos.

In the current study, misleading videos were mainly provided by independent users. Likewise, independent users were providers of low-quality videos on YouTube in published reports on COVID-19 [22, 23]. These results suggest that online users should pay attention to sources YouTube videos when processing information. They need to rely more on videos originating from universities and physicians.

YouTube is an interactive social media platform. Its users may submit their comments on videos and express their attitude toward diseminated information by “likes” and “dislikes”. In the current study, no significant difference was detected in views, likes, dislikes, and comments per day between groups. Significant difference was detected in DS scores among the groups, and videos in the high-quality group had the highest scores.

Low-quality and misleading YouTube videos have attracted numerous online users during the outbreaks of various viral infections [21, 24]. Consistent with our results, there are studies that did not detect a significant difference between groups in the specified video parameters [11, 25]. In addition to all these studies, some researchers declared that useful videos tend to have higher number of views and likes per day [10, 26]. These video parameters should not be used as indicators for choosing YouTube videos. These parameters are dynamic and changing over time.

Our study has some limitations inherent to YouTube video analyses. All videos were evaluated cross-sectionally at a single timepoint. Considering the dynamic origin of YouTube parameters, dissimilar results can be obatined at different timepoints. Additionally, we evaluted only English language videos. As such, our results do not reflect featutes non-Anglophone YouTube videos. Finally, our quality assessments may have a subjective structure, though certain inclusion and exclusion criteria were set.

CONCLUSION

High and low-quality YouTube videos show balanced distribution in the field of COVID-19 pulmonary rehabilitation. User preference is important to retrive and watch accurate and reliable videos. Paying attention to sources of YouTube videos is of utmost importance. Video parameters other than sources should not be considered as quality indicators. Universities and physicians should produce more YouTube videos to actively disseminate accurate information in the time of the COVID-19 pandemic.

ETHICS APPROVAL

Publicly available YouTube videos were used in this study. No ethics review and approval are required for this type of study.

FUNDING

None

AUTHOR CONTRIBUTIONS

BFK and AA designed the study. BFK, AA and ARS reviewed videos and generated data. BFK analyzed the data and drafted the ititial draft. BFK, AA and ARS revised the initial manuscript. BFK prepared the tables and figure.

CONFLICTS OF INTEREST

All authors have completed the ICMJE Disclosure Form (http://www.icmje.org/disclosure-of-interest/; available on request from the corresponding author). All authors declare that there are no potential conflicts of interest.

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COVID-19 КЕЗІНДЕ ӨКПЕНІ ОҢАЛТУ БОЙЫНША YOUTUBE БЕЙНЕРОЛИКТЕРДІ ТАЛДАУ

Түйіндеме

Кіріспе: YouTube - бұл желідегі пайдаланушылар денсаулық туралы ақпарат алу үшін жиі қолданатын танымал әлеуметтік желі платформасы. Өкпені оңалту бағдарламалары COVID-19 емдеу хаттамаларында ерекше орын алады. Бұл зерттеудің мақсаты COVID-19 кейін өкпені оңалту туралы YouTube-ғы бейнероликтерді бағалау болды.

Әдістер. «COVID-19 өкпені оңалту», «COVID-19 өкпе жаттығуы» және «COVID-19 өкпе физиотерапиясы» сияқты іздеу тегтеріне сәйкес келетін жалпы алғанда 180 бейнероликтер табылды. Оның 63 бейне зерттеуге қосу критерийлеріне сәйкес келді. Сапа мен сенімділікті бағалау үшін жаһандық сапа шкаласы (GQS) және модификацияланған DISCERN құралы пайдаланылды. Бейне ұзақтығы, жүктеу күні, көру саны, ұнатулары, ұнатпағандары және пікірлер жазылды. Бейне көздері анықталды.

Нәтижелер. 63 бейнероликтің 22-і (34,9%) сапасы жоғары топқа, 19-ы (30,2%) сапасы орташа топқа, 22-сі (34,9%) сапасы төмен топқа жатқызылды. Сапасы жоғары бейнероликтердің негізгі көзі университеттер мен дәрігерлер болды. Бейненің басқа да авторлары, емделуші, тәуелсіз пайдаланушылар және денсаулыққа қатысты веб-сайттар көптеген сапасыз бейнелерді дайындады. Сапа топтары арасында күнделікті көру, ұнату, ұнатпау және пікірлерінде айтарлықтай айырмашылық болған жоқ ($p > 0,05$).

Қорытынды: Сапасы жоғары, орташа және төмен бейнелердің арақатынасы шамамен бірдей болды. Дәл, расталған ақпараты бар бейнелерді табу үшін бейнежазбаның дереккөздерін ескеру керек.

Түйінді сөздер: әлеуметтік желі, YouTube, COVID-19, өкпені оңалту, өкпе жаттығулары, өкпе физиотерапиясы

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АНАЛИЗ ВИДЕОРОЛИКОВ YOUTUBE ПО ЛЕГОЧНОЙ РЕАБИЛИТАЦИИ ПРИ COVID-19

Резюме

Введение: YouTube - популярная платформа социальной сети, которую онлайн-пользователи часто используют для получения информации о здоровье. Программы легочной реабилитации занимают важное место в протоколах лечения COVID-19. Целью этого исследования было оценить видеоролики на YouTube о легочной реабилитации после COVID-19.

Методы. В общей сложности было найдено 180 видеороликов, соответствующих таким тегам поиска как «легочная реабилитация COVID-19», «легочные упражнения при COVID-19» и «легочная физиотерапия COVID-19». Из них 63 видео соответствовали критериям включения в исследование. Для оценки качества и надежности использовались Глобальная шкала качества (GQS) и модифицированный инструмент DISCERN. Были записаны продолжительность видео, дата загрузки, количество просмотров, лайков, антипатий и комментариев. Определены видеоисточники.

Результаты. Из 63 видео 22 (34,9%) были отнесены к группе высокого качества, 19 (30,2%) к группе среднего качества и 22 (34,9%) к группе низкого качества. Основными источниками высококачественных видеороликов были университеты и врачи. Другие авторы видео, пациенты, независимые пользователи и веб-сайты, связанные со здоровьем, производили много видео низкого качества. Не было обнаружено существенной разницы в количестве просмотров, лайков, антипатий и комментариев в день между группами качества ($p > 0,05$).

Вывод: соотношение видео высокого, среднего и низкого качества было примерно одинаковым. Чтобы найти ролики, содержащие точную проверенную информацию необходимо учитывать источники видео.

Ключевые слова: Социальные сети, YouTube, COVID-19, легочная реабилитация, легочные упражнения, легочная физиотерапия

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