YOUTUBE AS A SOURCE OF INFORMATION ABOUT GONORRHEA

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Abstract
Introduction: The purpose of this study was to systematically evaluate the quality of videos on YouTube related to gonorrhea.
Methods: Using the search term “gonorrhea”, the first 200 relevant videos on YouTube were saved to a file. All video parameters, including the number of views, likes, dislikes and comments were recorded. The Global Quality Scale (GQS) was used to evaluate the quality of the videos.
Results: After exclusions, 144 videos were selected and evaluated by two independent observers. The median duration of the videos was calculated as 3.97 minutes. Most videos were provided by physicians (59 videos). According to the GQS scores, 47.9% (n=69) of the videos were evaluated as high quality, 19.4% (n=28) as intermediate quality, and 32.6% (n=47) as low quality. There were significant differences in video length between the high, intermediate, and low-quality groups (p<0.001).
Conclusion: YouTube can be considered an important source of gonorrhea videos.

Keywords: Gonorrhea, YouTube, sexually transmitted diseases, infection

INTRODUCTION
According to World Health Organization (WHO) data, an average of 357 million people are diagnosed with sexually transmitted diseases (STDs) annually and approximately 78 million of these cases are gonorrhea infection, which is the second most frequently reported STD. Young adults are the group most infected by STDs worldwide [1]. Of the gonorrhea cases reported in Europe, the number of male cases is approximately three-fold higher than the number of female cases, and 44% of the cases are aged 15-24 years [2]. The majority of social media users are young adults aged 18-34 years, which is the age group in which STDs are most common [1, 3].
Social relationships and access to information have changed with new communication technology. The number of people actively using the internet worldwide is approximately 4.3 billion, and these people spend an average of 6.5 hours a day on the internet. Videos are watched on the internet by 92% of internet users and 84% of users use the internet every day. YouTube is one of the most used social media platforms with more than one billion members worldwide [3, 4, 5]. Adolescents and young adults who use digital forms of communication intensively also use digital media to search for health information about HIV and other STDs on the internet [6, 7]. In a study by Amante et al., it was stated that almost half of American adults use the internet to get health-related information [8]. Stigmatization and shame about STDs result in avoidance of gonorrhea and HIV-related tests and controls [9, 10]. In consideration of all these factors, YouTube is a very important source of health information, especially for patients, as it offers extensive content and free videos to a large number of users, and allows people to access information about their health. The reliability of the video content and the quality of the videos are important issues at this point. Despite all its positive features, there are concerns about users accessing high-quality information on YouTube [11]. YouTube contains both high-quality informational videos and misleading videos [12].

YouTube is a popular source of health information and gonorrhea is a common STD for which people may seek information on YouTube. The primer aim of this study was to analyze the videos on YouTube related to gonorrhea in terms of the level of information quality, number of views and likes, and video content. The secondary aim was to evaluate the video sources in terms of video information quality.

**METHODS**

**Data collection and search strategy**

Videos related to gonorrhea were searched on YouTube™ (http://www.youtube.com) on 01 June 2021. The top 200 videos ranked by relevance for the search term “gonorrhea” were saved as a file for later evaluation. Research has shown that a huge percentage of users (97.5%) view videos on the top 10 pages of query results [13]. Therefore, the first 10 pages (20 videos per page, 200 videos in total) were included in the study as in similar studies [14, 15]. Video listings were selected based on relevance, as applied in many studies [15, 16, 17]. The browsing history was deleted before the search so that it was not affected by previous searches. Off-topic, non-English, duplicate, and unclear videos (no audio) were excluded from the study.

**Video parameters**

For each video, the date of upload, the duration of the video, the number of views, comments, likes, and dislikes were recorded. Comments per day, likes per day and views per day values were calculated for each video based on the total number of days the video remained on YouTube. The total number of days is calculated by the time from the upload of the video to the date of the search (01 June 2021).

**Video contents**

Videos with transmission route, symptoms, causes, treatments, definitions, diagnosis, complications, preventions, and risk factors content related to gonorrhea were also specified. More than one piece of content can be included in a video.

**Video sources**

Video sources were categorized under eight main headings; physician (1), university (2), independent users/blog (3), news agencies (4), non-physician healthcare personnel (5) TV, talk show (6) organization/association (7), patient (8).

**Evaluation of quality and reliability**

*The Global Quality Scale (GQS) was used to assess the video quality. Bernard devised the GQS tool, which spans from 1 to 5 points. A video with 4 or 5 points is regarded as high quality, 3 points are considered intermediate quality, and 1 or 2 points are considered low quality. Previous research using comparable methodologies has been performed in the literature [18, 19].

Scoring:

1. There are unacceptable problems in terms of quality and flow, profound deficiencies in the information presented, and not at all helpful to individuals.
2. There are obvious deficiencies in quality and flow. Some material is presented but many crucial issues missing, making it of very limited utility to individuals.
3. Moderate quality, substandard flow, vital information is partially discussed but others are not, moderately useful for individuals.
4. No notable issues with quality and flow; most necessary material is given, although some issues are left out; valuable for individuals.
5. Quality and flow, highly beneficial to individuals.

*The modified DISCERN tool (DS) was used to score the reliability of the videos. In this scale, adapted by Singh, the discrimination score ranges from 0 to 5 points. A high score on this scale indicates high reliability. Each yes
answer is given a point and consists of a total of 5 questions [17, 20].

Questions:
1. Is the video comprehensible, brief, and easy to follow?
2. Are reputable information resources presented?
   Is the details provided fair and objective?
3. Are extra resources of information for patients' use listed?
4. Are there any parts of ambiguity or contention referred to?

Information quality and reliability of videos were independently evaluated by two public health specialists (EK, YS). Any disagreements between the referees were resolved when the researchers met again and reached the final decision.

Ethics
Ethics Committee approval was not required for this study as the videos were all in the public domain.

Statistical analysis
The data were statistically evaluated using SPSS vn.15 software. For inter-rater reliability, Cohen’s kappa coefficient was employed. Because some data had extreme values, the results were expressed as median (minimum, maximum) values. The Kolmogorov-Smirnov test was used to determine if the data conformed to a normal distribution. Video parameters comparison between quality groups Kruskal Wallis (for non-normally distributed data) test was used. A value of p<0.05 was accepted as statistically significant.

RESULTS
From the 200 videos identified in the initial search, duplicate, non-English, off-topic videos, and unclear (no audio) videos were eliminated. After all inclusion and exclusion criteria, 144 videos were included in the final evaluation. The screening process for the study is presented in Figure 1. The Kappa scores between the raters were 0.77 and 0.88 for the GQS and DS tool, respectively.

The median duration of the videos was calculated as 3.97 minutes. The median number of views was 6253, the number of likes was 35, the number of dislikes was 3, and the number of comments was 7 (Table 1).

<table>
<thead>
<tr>
<th>Video features</th>
<th>Median (min–max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video lengths (minutes)</td>
<td>3.97 (0.48-146.08)</td>
</tr>
<tr>
<td>Number of views</td>
<td>6253 (1-1082264)</td>
</tr>
<tr>
<td>Number of likes</td>
<td>35 (0-5066)</td>
</tr>
<tr>
<td>Number of dislikes</td>
<td>3 (0-966)</td>
</tr>
<tr>
<td>Number of comments</td>
<td>7 (0-2957)</td>
</tr>
</tbody>
</table>

When the content of the videos was examined, 81.2% (n=117) provided information on transmission route, 78.5% (n=113) on symptoms, 78.5% (n=113) on causes and 71.5% (n=103) on treatments. The distribution of the videos according to content is shown in Table 2.

<table>
<thead>
<tr>
<th>Video contents*</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission route</td>
<td>117</td>
<td>81.2</td>
</tr>
<tr>
<td>Symptom</td>
<td>113</td>
<td>78.5</td>
</tr>
<tr>
<td>Causes</td>
<td>113</td>
<td>78.5</td>
</tr>
<tr>
<td>Treatment</td>
<td>103</td>
<td>71.5</td>
</tr>
</tbody>
</table>
In the quality evaluation of the videos, 47.9% (n=69) were in the high-quality group, 19.4% (n=28) in the intermediate-quality group, and 32.6% (n=47) were in the low-quality group. When the videos were analyzed by source, physicians (n=59; 41%) were the most common sources for gonorrhea videos, followed by independent users/blogs (n=50; 34.7%). It was revealed that 61.0% of the videos from physicians were of high quality, and 75% of the videos from universities were of high quality (Table 3). There were significant differences in video length (p<0.001) and DS scores (p<0.001) between the high, intermediate, and low-quality groups. The duration was longer and DS scores were significantly higher in high-quality videos. In the examination of the other parameters, no significant difference was found between the quality groups in respect of views, views/day, likes/day, and likes ratio (Table 4).

**Table 3. Quality categorization of the videos according to video sources, n (%)**

<table>
<thead>
<tr>
<th>Video source</th>
<th>Low quality</th>
<th>Intermediate quality</th>
<th>High quality</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>14 (23.7)</td>
<td>9 (15.3)</td>
<td>36 (61.0)</td>
<td>59 (41)</td>
</tr>
<tr>
<td>University</td>
<td>0 (0)</td>
<td>1 (25.0)</td>
<td>3 (75.0)</td>
<td>4 (2.8)</td>
</tr>
<tr>
<td>Independent users/blog</td>
<td>17 (34)</td>
<td>10 (20)</td>
<td>23 (46)</td>
<td>50 (34.7)</td>
</tr>
<tr>
<td>News agencies</td>
<td>4 (44.4)</td>
<td>4 (44.4)</td>
<td>1 (1.1)</td>
<td>9 (6.2)</td>
</tr>
<tr>
<td>Nonphysician health personnel</td>
<td>0 (0)</td>
<td>1 (33.3)</td>
<td>2 (66.7)</td>
<td>3 (2.1)</td>
</tr>
<tr>
<td>TV, talk show</td>
<td>3 (100)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>3 (2.1)</td>
</tr>
<tr>
<td>Organization/association</td>
<td>2 (22.2)</td>
<td>3 (33.3)</td>
<td>4 (44.4)</td>
<td>9 (6.2)</td>
</tr>
<tr>
<td>Patient</td>
<td>7 (100)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>7 (4.9)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>47</td>
<td>28</td>
<td>69</td>
<td>144</td>
</tr>
</tbody>
</table>

n, number; %, percentage, row percent in the quality area, column percent in the total column.

### DISCUSSION

We evaluated the videos related to gonorrhea on YouTube in terms of quality. The advantages of visuality and ease of access to information in online searches has increased the popularity of YouTube among people [21]. Being able to access online information with the use of the correct resources can increase patient satisfaction and reduce the harmful effects of diseases [22]. YouTube has been shown to be an important educational tool influencing health behavior on safe sex and sexual risk prevention for young adults, who are a major risk group for STDs [23]. It is possible to inform the patient in many different ways other than face-to-face, doctor-patient interviews, but the patient inability to evaluate the accuracy of the information may cause various problems. While high information quality videos can be quite beneficial, the spread of low information quality videos is a concern for STDs.

In this study, in which videos about gonorrhea were investigated, the videos had a total of over two million views. The findings of this study showed that while transmission routes, symptoms, and causes of gonorrhea were mentioned the most, the risk factors and prevention of the disease were mentioned the least. This may be an indication that the videos on gonorrhea on YouTube are to raise awareness of the general public. These results highlight the importance of people’s information.

When the videos were grouped as low, intermediate, and high quality, the rate of high-quality videos was found to be 47.9%. In literature, the rates of videos containing useful or high-quality information in the study on HIV, another important sexually transmitted disease 47.3%, in the study on ankylosing spondylitis 48.2%, in the study on echocardiography 27.7%, and in the study on hypertension 63% [14, 15, 19, 24]. The difference in the number of videos in the studies and the subjective evaluation of the videos even though they are based on objective criteria may cause conflicting results.

When the video information sources were evaluated according to quality, most of the videos in the high-quality group were sourced from physicians. All the videos from patients and television/talk shows were in the low-quality group. It may be a good approach to look at video sources to focus on the right video for information about gonorrhea. Providers should be aware that their patients may be accessing low-quality information on gonorrhea on YouTube. The general population should be educated on how to identify well-sourced information as it pertains to their sexual health. Similar to the current study, there
are studies showing that high-quality videos are sourced by healthcare professionals and healthcare organizations, while low-quality videos are sourced by medical advertisements, independent users, and non-profit organizations [19, 20, 25, 26]. The provision of education by healthcare professionals is important to be able to achieve good quality health [27]. In YouTube videos on various health topics, the number of videos uploaded by independent users and bloggers is higher than videos by doctors [28]. In the current study, physicians were the leading source of information, but independent users were also a large source of gonorrhea videos. Physicians upload more videos with high-quality information about gonorrhea making the general public more aware of STDs.

In this study, the median length of videos containing high-quality information was significantly longer. Video duration can be an important determinant in distinguishing high-quality information. In a study investigating YouTube videos about diabetes and oral health, the videos in the useful category were of longer duration [29]. Other studies on echocardiography and vesicoureteral reflux on YouTube have also reported that longer videos contain higher quality information [14, 16]. Extending the video duration allows any subject to be analyzed in more detail and for more detailed information to be given.

The number of views and likes are important indicators that determine the popularity of YouTube videos. YouTube users can click the like or dislike buttons or comment on the videos. These indicators can affect the choice of video to watch [30]. In our study, we could not find a relationship between views/day, likes/day and comment/day values, and video quality. Although the median value of the number of views was not statistically significant, it was found to be higher for high-quality videos than for low and intermediate-quality videos. In general, we thought that the number of views, likes, and comments did not indicate high-quality videos. So users may have trouble judging the quality of YouTube videos. The results of this study also showed that videos with high DISCERN scores are significantly classified as high-quality videos. High-quality videos are also more reliable.

Examining YouTube videos can provide researchers with ideas for new hypotheses. New hypotheses can be generated by identifying the issues that Internet users are most interested in, as well as the areas where there are obvious deficiencies. YouTube videos can be used to determine public and social requirements, and research can be conducted on that basis.

There were some limitations to this study, the most important of which is that the study was conducted in a narrow time interval. Considering the dynamic nature of YouTube, studies conducted at different times may lead to different results. Other limitations were that only English videos were analyzed, and although scores were used, evaluation of the videos was subjective.

CONCLUSION
YouTube should be considered as a complex structure where accurate and reliable health-related information can be presented as well as erroneous and misleading ones. From this perspective, Central Asian scholars should be wary of the entire information-gathering process on YouTube. At this stage, Central Asian researchers should recognize the significance of video sources and should concentrate their efforts on videos from physicians, academics, and universities. In today's conditions, the use of the Internet is indispensable in scientific activities. Internet platforms should be widely used in the process of creating new hypotheses, accessing up-to-date sources, and disseminating scientific production. Inexperienced Central Asian researchers should be instructed on the tricks of obtaining information from the Internet and should be informed about accessing reliable sources.

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None

AUTHOR CONTRIBUTIONS
EK, YS, and BFK designed the study. EK and YS collected the data. EK, YS, and BFK analyzed the data. EK and BFK interpreted the data analyses. EK, YS, and BFK drafted the study and reviewed it critically for important intellectual content. EK and BFK prepared tables. EK, YS, and BFK approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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

DISCLAIMER
No part of this review is copied or published elsewhere in whole or in part.
References

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Table 4. Analysis of video characteristics according to GQS quality, median (minimum-maximum)

<table>
<thead>
<tr>
<th></th>
<th>Low (n=47)</th>
<th>Intermediate (n=28)</th>
<th>High (n=69)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video length (min)</td>
<td>2.03 (0.48-16.70)</td>
<td>3.90 (1.20-75.90)</td>
<td>6.43 (1.06-146.08)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Views</td>
<td>6248 (8-1082264)</td>
<td>5010 (1-403266)</td>
<td>7015 (9-887368)</td>
<td>.998</td>
</tr>
<tr>
<td>Views/day</td>
<td>6.94 (0.07-850.16)</td>
<td>5.86 (0.05-482.37)</td>
<td>5.81 (0.10-266.63)</td>
<td>.974</td>
</tr>
<tr>
<td>Likes/day</td>
<td>0.03 (0-3.53)</td>
<td>0.04 (0-1.57)</td>
<td>0.05 (0-3.10)</td>
<td>.623</td>
</tr>
<tr>
<td>Dislikes/day</td>
<td>0.01 (0-0.76)</td>
<td>0.01 (0-0.36)</td>
<td>0.01 (0-0.08)</td>
<td>.421</td>
</tr>
<tr>
<td>Likes ratio*</td>
<td>0.94 (0.01-1)</td>
<td>0.91 (0.01-1)</td>
<td>0.96 (0.13-1)</td>
<td>.061</td>
</tr>
<tr>
<td>Comments/day</td>
<td>0.01 (0-10)</td>
<td>0.01 (0-3.54)</td>
<td>0.01 (0-0.52)</td>
<td>.655</td>
</tr>
<tr>
<td>DISCERN score</td>
<td>1 (0-4)</td>
<td>3 (1-5)</td>
<td>5 (3-5)</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

*Likes ratio: like/like+dislike
YOUTUBE ГОНОРЕЯ ТУРАЛЫ АҚПАРАТ ҚӨЗІ РЕТИҢДЕ

Түйіндеме

Кірісіне. Бул зерттеудің мақсаты – гонореяға қатысты YouTube бейнеролерінің сапасын құжатты тұрғын багалау.

Әдістери. «Гонорея» ізденіс сұрансысы арқылы YouTube-ға 200 сәйкес бейнелер тандылды, сақталды. Ары қарай, барлық бейнелер параметрлері, сондық ішінде құрал, ұнатуалар, ұнатпаулар және пікірлер сапы жазылыды. Бейне сапасын багалау үшін қарапайым сапа шкаласы (GQS) пайдаланылды.

Нәтижелер. Алынған кейін қалған 144 бейнен әріктеліп, екі тәуелсіз бақылауы бұғадады. Бейненің орташа ұқығы 3,97 минутты құрады. Бейнероликтердің құбісін дәрігерлер дайындаған (59 бейнеролик). GQS нәтижелері бойынша бейнеролік 47,9%-ы (n=69) жоғары сапалы, 19,4%-ы (n=28) орташа сапалы және 32,6%-ы (n=47) сапасы темен деп бөлінген. Жоғары, орташа және темен сапалы топтар арасында бейненің ұқығыныңа айырмашылықтап айырмашылықтар айырымалды (p<0,001). Қорытынды: YouTube-тың гонорея бейнеролерінің маңызды кәсіп деп саналуға болады.

Негізгі сәйдір: гонорея, YouTube, жыныстық жолмен берілетін аурулар, жұқпаулер.

Дайынған үшін: Кая Е., Солак Я., Кочыгит Б.Ф. YouTube гонорея туралы акпарат қози ретінде. Орталық Азия медициналық гипотеза және этика журнали 2022:3(2):103-110. https://doi.org/10.47316/cajmhe.2022.3.2.03

YOUTUBE КАК ИСТОЧНИК ИНФОРМАЦИИ О ГОНОРЕЕ

Резюме

Введение. Целью данного исследования является систематическая оценка качества видео на YouTube, связанных с гонореей.

Методы. Используя поисковый запрос «гонорея» были отобраны и сохранены 200 релевантных видео на YouTube. Далее записывались все параметры видео, включая количество просмотров, лайков, дизлайков и комментарии. Для оценки качества видео использовалась глобальная шкала качества (GQS) использовалась.

Результаты. После исключения оставшиеся 144 видеоролика были отобраны и оценены двумя независимыми наблюдателями. Средняя продолжительность видео составила 3,97 минуты. Большинство видео были подготовлены врачами (59 видео). По результатам GQS, 47,9% (n=69) видео были оценены как высококачественные, 19,4% (n=28) были оценены как видео среднего качества и 32,6% (n=47) были оценены как видео низкого качества. Были выявлены значительные различия в продолжительности видео между группами высокого, среднего и низкого качества (p<0,001).

Вывод: YouTube можно считать важным источником видео о гонорее.

Ключевые слова: гонорея, ютуб, венерические заболевания, инфекция.

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