Is YouTube Effective On Covid-19 Vaccination During Pregnancy

şükran doğru (mailto:sukrandogru-2465@hotmail.com)
Necmettin Erbakan University (NEU) Meram Faculty of Medicine Perinatology clinic, konya,TURKEY
https://orcid.org/0000-0002-3383-2837

fatih akkuş
Necmettin Erbakan University (NEU) Meram Faculty of Medicine Perinatology clinic, konya,TURKEY
https://orcid.org/0000-0001-7037-0165

Research Article

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Abstract

Aim: YouTube® is one of the most frequently used social media platforms worldwide. The quality of the videos is of utmost significance in terms of the accurate information for pregnant women and in the diagnosis, treatment, and prevention of life-threatening diseases such as COVID-19. This study aimed to evaluate the content and quality of YouTube videos that pregnant women make use of as a source of information for covid-19 vaccines.

Methods: A search was made on YouTube with the keywords and phrases such as "pregnancy and covid vaccination", "is the covid vaccine risky in pregnancy?". A total of 54 videos in English were analyzed. Video sources were divided into 5 groups as hospitals, professional medical chambers, pregnant women, physicians and news channels. The quality of the contents was evaluated with DISCERN, GQS and the pregnancy covid vaccine index (CAI) we have developed for this purpose.

Results: Of these videos, we have detected that 20 (37%) were shared by hospitals, 5 (9%) were shared by physicians, 5 (9%) were shared by pregnant women, 22 (41%) were shared by news programs or news program hosts, and 2 (4%) were shared by medical chambers. The mean DISCERN score was 33.2±17. The pregnant group was significantly different from the other groups in terms of GQS (p=0.048). There was no significant difference between the groups in terms of covid vaccination index during pregnancy (p = 0.501).

Conclusion: This study revealed that There is an urgent need to regulate the content of videos pursuant to medical guideline.

Introduction

Today, many people make use of online systems to obtain information about health. In this regard, YouTube is the second most used source of information throughout the world. Although its reliability has been tested and verified with respect to many health-related issues, no evaluation has been made concerning the videos of SARS (severe acute respiratory syndrome) covid-19 vaccination during pregnancy.1,2

On December 31, 2019 Wuhan Municipal Health Commission (Wuhan, China) reported a series of pneumonia cases to WHO (World health organization), then in the following period as of January 2020 it was reported that a novel corona virus which causes severe acute respiratory syndrome was at stake and it was called coronavirus 2(SARS CoV 2). Three months after the initial covid 19 outbreak, cases were seen in more than 150 countries across the world. It was declared a pandemic on March 11, 2020 and had caused significant morbidity and mortality worldwide.3

Although acute respiratory distress and serious complications were reported regarding pregnant women during previous corona virus infections, those figures were respectively very low. During the 2009 influenza A H1N1 pandemic, 5% of the deaths in the USA were of pregnant women which corresponded to
1% of the American population. During the current covid 19 infection, which has become a pandemic, the impacts on pregnant women, fetuses and infants were uncertain and undetermined at the beginning. Although there are small scaled studies which had been conducted demonstrating that it causes an increase in preterm birth, caesarean section delivery rates and intensive care unit admissions, its impacts within the scope of miscarriage, stillbirth, intrauterine growth retardation, long-term effects and neurodevelopmental side effects remained unanswered. A systematic multi-national review of 60 studies on SARSCoV-2 in pregnancy reported that severe illness occurred in up to 18% of pregnant patients and critical disease complicated up to 5% of cases, comparable to rates in the general population.

While vaccine studies were initiated against the Covid 19 pandemic, pregnant women were excluded from the clinical study pursuant to the traditional approach due to the fear of fetal side effects. There is negligible data available on the safety and efficacy of the vaccine in pregnancy, as vaccine companies exclude pregnant women from their phase studies. Considering the heavy burden and severity of the disease all pregnant women should be recommended to be vaccinated. It is not quite a correct approach to expect a different side effect from the non-pregnant population with respect to mRNA vaccines which have never been experienced before. The vaccine is immediately degraded at the injection site and is absorbed by the lymphatic system. The probability of access to the placenta and transmission to the fetus remains very low. It has been reported that there is no harm in the use of antipyretics for side effects such as fever due to vaccines.

Taking the constantly growing popularity of YouTube and the fact that patients get information about their diseases before going to their physicians and decide on the treatment option by watching these videos into consideration, we believe that the quality and reliability of these videos should be improved. In this study, we aimed to evaluate the quality and reliability of the informative role of social media with respect to these concerns while evaluating the anxious concerns we have while giving information about vaccination during the COVID 19 pandemic period to pregnant women who applied to our outpatient clinic.

**Methods**

In September 2021, "pregnancy and covid vaccination" and "does covid vaccine bear risks in pregnancy" were scanned on YouTube (http://www.youtube.com). Duplicate videos, non-English videos, non-related content, videos that were included because only the keywords namely covid and pregnancy were excluded by using the YouTube filtering system. As a result of this scanning, 77 videos were reduced to 54 videos in total and an evaluation was made.

A total of 54 videos were evaluated by two independent obstetrician and gynecologist (Ş.D. and F.A.). For each video, first of all the uploading user or institutions were taken into consideration and then they were divided into 5 groups as hospitals (A), professional medical chambers (B), pregnant women (C), physicians (D) and news channels (E). The date of publication of all videos, the number of views, the duration of the video, the number of likes and dislikes, and the number of comments were recorded. The
proficiency and quality of the videos were evaluated using DISCERN and the Global Quality Scale (GQS). DISCERN is a scoring method consisting of a total of sixteen questions, scored from 1 to 5, and evaluated with a minimum of 16 and a maximum of 80 points (high quality). According to this method of scoring, 64-80 points are deemed excellent, 52-63 points are deemed good, 41-51 points are deemed poor, 30-40 points are deemed bad, 16-29 points are deemed very bad. GQS is a scoring system that evaluates the information level of the video using a 1 to 5 point scoring system.

There is no reliable video scoring system available which is specific to covid vaccination during pregnancy. In this study, we scored all videos by creating an index of covid vaccination in pregnancy (CAI). Within the scope of this scoring, provided that the vaccine side effects, safety, non-teratogenicity, formation of fetal and maternal antibodies, the risks of covid disease in pregnancy, vaccination in pregnant women who previously had covid, the number of doses to be made, the authorized vaccine brand recommendation and the suitable trimester during which vaccination may be administered is mentioned, the videos were rated as 1 corresponding to each question whereas the videos in which such questions were not made mention of were rated as 0. For the video that answered all questions 9 points had been given whereas for the video that did not answer the mentioned questions at all had been given 0 points (Table 1). We did not apply to any medical ethics committee for approval of this study, according to the Declaration of Helsinki of the World Medical Association, because no patient data or material were used and all videos used for the study were available on a public social media website (YouTube).

STATISTICS

Statistical calculations were performed using SPSS version 25 (IBM Corp. Armonk, NY, USA). Categorical values were denoted as frequency, and continuous data was denoted as mean, median, and standard deviation. Shapiro-Wilk test was used to evaluate the normal distribution and Levene test was used for variance homogeneity. Spearman correlation test was utilised. Kruskal-Wallis and Dunn Bonferroni post-hoc tests were used for analysis between groups. Inter-rater reliability was determined by Cohen's kappa score (≤0 indicating no agreement, 0.01-0.20 indicating none to slight, 0.21-0.40 as fair, 0.41-0.60 as moderate, 0.61-0.80 substantial, 0.81 – 1.00 as almost perfect agreement). The correlation was determined as poor (0.00-0.20), fair (0.21-0.40), moderate (0.41-0.60), good (0.61-0.80), or excellent (0.81-1.00) respectively. The significance threshold was acknowledged as p<0.05.

Results

A total of 77 videos were encountered regarding pregnancy and covid 19 vaccination. Of these, 54 videos were found suitable for the criteria. All calculations were evaluated over these determined 54 videos. Of these 54 videos, we have detected that 20 (37%) were shared by hospitals, 5 (9%) were shared by physicians, 5 (9%) were shared by pregnant women, 22 (41%) were shared by news programs or news program hosts, and 2 (4%) were shared by medical chambers. The mean DISCERN score was 33.2±17. Accordingly, 5 (10%) videos were evaluated as excellent, 6 (11%) videos were evaluated as good, 7 (13%)
videos were evaluated as moderate, 8 (15%) videos were evaluated as bad, and 28 (51%) videos were evaluated as very bad.

The oldest dated video was added in December 2020, and the latest dated video was added in September 2021. The number of views per video is 19,154,15±31.092 and the total number of views of the videos is 2,068,648. The average number of likes and dislikes per video is 178.46 and 98.22, respectively. The average total video duration in terms of seconds was 331.11 secs. A detailed descriptive analysis of 54 videos is given in Table 2.

If we were to analyze between groups (A, B, C, D, E), DISCERN scores were 35.25, 35.40, 20.20, 34.00, 31.50, respectively. Looking at these values, it is seen that the videos are generally weak and of poor quality. There was no significant difference between the groups in terms of DISCERN scores, (p= 0.391). Through the instrumentality of Global Quality Scale, the average score was 2.63 over 5. If we were to analyze between groups (A, B, C, D, E), GQS scores were 3.00, 2.20, 1.40, 2.68, and 2.50, respectively. Group C was significantly different from other groups in terms of GQS (p=0.048). According to the Mann-Whitney U test performed between the groups, a significant difference was found between the hospital (A) and pregnant women (C) groups in terms of GQS scores (p=0.003). If we were to analyze between groups (A,B,C,D,E),ovid vaccination index values during pregnancy were 4.80, 4.00, 3.00, 4.27, 4.50, respectively. No significant difference was observed between the groups in terms of covid vaccination index during pregnancy (p= 0.501). Tablo 3,4

According to the reliability analysis (kappa score) for the inter-rater assessment agreement, it was seen that the kappa score for the GQS was 0.926 (p=0.0001), the kappa score for DISCERN was 0.919 (p=0.001), and the kappa score for CAI was 0.915 (p=0.001). It was determined that there was a perfect fit for the CAI scoring system.

**Discussion**

Within the scope of COVID-19 vaccine initiative, phase I, II, and III studies have often been combined with a smooth transition from one phase to the next. In early January 2020, they first revealed the genome sequence of SARS-CoV-2 by PCR method. At the end of 2020, vaccines were produced in different parts of the world. Approximately 150 vaccines have been preclinically studied, but fewer than 50 vaccines have reached and succeeded phase II-III trials. Strict safety criteria continue to be applied in vaccine studies, data safety and monitoring committees comprised of independent vaccine experts and study sponsors evaluate reported side effects at each stage of the clinical trial and approve progress to the next stage. In the United States, the Food and Drug Administration (FDA) approves the process at each stage for clinical trials to be administered on humans.

BNT162b2 (Pfizer-BioNTech COVID-19 vaccine) is indicated for individuals at 12 years of age and older. mRNA-1273 (Moderna COVID-19 vaccine) is indicated for individuals at 18 years of age and older. Ad26.COV2.S (Janssen COVID-19 vaccine) is indicated for individuals at 18 years of age and older.
Sinovac's CoronaVac vaccine, on the other hand, has been approved for a wide audience, but there have been concerns about its effectiveness. Since the origin of the videos we have scanned and reviewed is Europe and America in general, Sinovac vaccine was not mentioned. The choice between COVID-19 vaccines is based on availability and patient preference. Data concerning the safety of COVID-19 vaccines on pregnant women are limited, but in the light of new data, it has been demonstrated that mRNA vaccines are safe with respect to pregnancy. The anti-vaccination movement and the opposition to vaccination that we have heard about frequently in recent years, unfortunately poses a great risk in terms of health all over the world.

This study aims to compare the educational content in YouTube videos about the administration of COVID-19 vaccines during pregnancy, which is an extremely sensitive subject. Vaccination is of great importance in terms of the fight against COVID-19. The videos about the COVID-19 vaccination during pregnancy on YouTube were evaluated according to the scoring systems that are well known in the literature and that we have adapted for this particular matter. It had been observed that there was no significant difference between the selected videos. The high correlation between DISCERN, GQS and the CAI scoring systems we developed indicates the safe usability of the CAI scoring system. As new scoring systems developed for YouTube are improved, choosing high-quality content and videos that provide accurate information will become an important part of education for the sake of the health system in the future. According to the study conducted by Yüksel et al., YouTube videos are easily accessible COVID-19 information resources for pregnant women. This study demonstrated that videos about pregnancy and COVID-19 have high viewing rates, but they are generally poor in terms of quality and reliability. In our study, the videos were predominantly uploaded by news sources and hospitals. The videos were generally of medium quality. The videos with the poorest quality and insufficient content were those uploaded by pregnant women. This situation suggested us that the videos uploaded individually (pregnant YouTube channel) are incompetent and deficient in terms of content.

According to our scoring system, 48.1% of the video contents did not make mention of vaccines’ side effects, 48.1% of them did not mention antibody response, 59.3% of them did not mention teratogenicity, 68.5% of them did not mention the number of vaccine doses, 68.5% did not mention the pregnancy trimesters, 88.9% failed to refer to vaccination in those who have previously had covid-19, 55.6% did not mention vaccine types, 55.6% did not mention brand recommendation for vaccination. In light of all these data, we may propound that the content of the videos about the vaccination of pregnant women during COVID-19 pandemic is insufficient. On the other hand, social media has increased health literacy. Yet another important feature of YouTube is that it allows even illiterate communities to learn and to get acquainted with new developments. It goes without saying that we presume such societies are more easily manipulated. Therefore, the accuracy of the information is of utmost importance. According to statistics, 74% of the global world watches YouTube and as of 2021, YouTube’s world user base is approximately 2,240.03 billion users. In the course of the internet age when we are aware that YouTube is such effective, we think that the contents of health-related videos should be informative, scientifically proven and should not allow for misunderstandings. Brendi Drozd et al. have also shown in their study
that there is no substantial scoring system developed for the assessment of YouTube videos.\textsuperscript{18} The fact that a video is watched by umpteen users or received a large number of comments does not show that it is sufficient in terms of content. No correlation was determined between the length of the videos we evaluated, the number of views, likes and dislikes. There was only a moderate correlation between likes and comments. We did not examine whether the comments were in favor or adverse.

In our study, we found that videos with a high number of views did not receive higher scores than other videos. When all videos were evaluated with three separate scoring systems, the group with the lowest score consisted of videos uploaded by pregnant women. The greatest difference was seen in the GQS score (p=0.048). Since the videos uploaded by pregnant women were few in our study, there may not have been a statistical discrepancy. In the videos evaluated by two physicians (Ş.D. and F.A.), the kappa score was found to be low in terms of DISCERN (0.112) and GQS (0.394) scoring systems, while a high agreement level was observed in the CAI (0.918) (p=0.00) scoring system. Thus we have speculated that the reason for this high agreement level was that the score we developed necessitated quantal responses.

There are certain limitations in our study. Our review of videos uploaded and watched in a short period of time is one of them. The fact that the subject is on the agenda and the data regarding COVID-19 vaccine and its use during pregnancy are insufficient at the time of the study may be the reason for the low number of relevant videos. Watching only English videos is also one of the limited aspects of the study. Furthermore, the lack of explicit data about some of the parameters (teratogenicity, etc.) examined in the CAI scoring system shows that there is a need for new evaluation systems.

Ultimately, the content of the videos should be evaluated independently and unbiased and the evaluation should be standardized by international organizations. Incomplete or incorrect information may lead patients to non-scientific treatments and the physician-patient relationship may be seriously damaged. For this reason, it is necessary to critically analyze the quality of health-related videos on YouTube which are very popular and frequently watched.

**Declarations**

**DISCLOSURE OF INTEREST:** The authors report no conflict of interest

**AUTHOR CONTRIBUTIONS:** Ş.Doğru and F.Akkuş designed this study. All authors approved the submitted manuscript.

**References**


17. YouTube® by the numbers. [Internet] Available from: https://www.statista.com


Tables

Table 1. Index of covid vaccination in pregnancy

<table>
<thead>
<tr>
<th>SIDE EFFECT</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAFETY</td>
<td>1</td>
</tr>
<tr>
<td>TERATOGENICITY</td>
<td>1</td>
</tr>
<tr>
<td>FORMATION OF FETAL MATERNAL ANTIBODIES</td>
<td>1</td>
</tr>
<tr>
<td>RISKS OF COVID DISEASE</td>
<td>1</td>
</tr>
<tr>
<td>VACCINATION OF PREGNANT WOMEN WHO PREVIOUSLY HAD COVID</td>
<td>1</td>
</tr>
<tr>
<td>NUMBER OF VACCINE DOSES</td>
<td>1</td>
</tr>
<tr>
<td>SUITABLE TRIMESTER DURING WHICH VACCINATION MAY BE ADMINISTERED</td>
<td>1</td>
</tr>
<tr>
<td>VACCINE BRAND</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2. Video characteristics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Seconds</td>
<td>331.11</td>
<td>25</td>
<td>962</td>
<td>223,413</td>
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<tr>
<td>Video Streaming</td>
<td>98.50</td>
<td>6</td>
<td>270</td>
<td>78,277</td>
</tr>
<tr>
<td>Like</td>
<td>178.46</td>
<td>0</td>
<td>4600</td>
<td>638,325</td>
</tr>
<tr>
<td>Unlike</td>
<td>.22</td>
<td>0</td>
<td>1800</td>
<td>308,631</td>
</tr>
<tr>
<td>Comment</td>
<td>67.31</td>
<td>0</td>
<td>1385</td>
<td>213,354</td>
</tr>
<tr>
<td>Number Of Views</td>
<td>19154.15</td>
<td>13</td>
<td>155900</td>
<td>31092,640</td>
</tr>
<tr>
<td>Gqs</td>
<td>2.63</td>
<td>1</td>
<td>5</td>
<td>1,138</td>
</tr>
<tr>
<td>Discern</td>
<td>33.22</td>
<td>16</td>
<td>76</td>
<td>17,475</td>
</tr>
<tr>
<td>Cai</td>
<td>4.33</td>
<td>1</td>
<td>9</td>
<td>2,119</td>
</tr>
</tbody>
</table>
Table 3. Comparison of scoring systems with respect to video sources

<table>
<thead>
<tr>
<th>Scoring type</th>
<th>hospital(a) n=20</th>
<th>organization(b) n=2</th>
<th>pregnant women(c) n=5</th>
<th>physician(d) n=5</th>
<th>news source(e) n=22</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISCERN</td>
<td>30.00(16-75)</td>
<td>31.50(16-47)</td>
<td>16.00(16-27)</td>
<td>38.00(16-57)</td>
<td>26.50(16-76)</td>
<td>.391</td>
</tr>
<tr>
<td>GQS</td>
<td>3.00 (2.00-5.00)</td>
<td>2.5(2.00-3.00)</td>
<td>1.00(1.00-2.00)</td>
<td>2.00(1.00-4.00)</td>
<td>3.00 (1.00-5.00)</td>
<td>.048</td>
</tr>
<tr>
<td>CAİ</td>
<td>5.00(1-8)</td>
<td>4.50(2-7)</td>
<td>4.00(1-5)</td>
<td>3.00(2-8)</td>
<td>4.5(1-9)</td>
<td>.501</td>
</tr>
</tbody>
</table>

Kruskal-wallis test, median (minimum-maximum) values, GQS: Global Quality Score; CAİ: Covid Vaccination Index, GQS and DISCERN scoring systems were in positive correlation with each other (p=0.00).

Table 4. Correlation Scoring Systems

<table>
<thead>
<tr>
<th></th>
<th>CAİ</th>
<th>GQS</th>
<th>DISCERN</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAİ</td>
<td>-</td>
<td>.723 (p=.00)</td>
<td>.637(p=.00)</td>
</tr>
<tr>
<td>GQS</td>
<td>.723 (p=.00)</td>
<td>-</td>
<td>.792 (p=.00)</td>
</tr>
<tr>
<td>DISCERN</td>
<td>.637(p=.00)</td>
<td>.792 (p=.00)</td>
<td>-</td>
</tr>
</tbody>
</table>

GQS: Global Qalıty Score; CAİ: Covid Vaccination Index.