RESEARCH ARTICLE

Reliability and accuracy of varicocoele videos in YouTube

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Abstract

Objectives: To evaluate the scientific impact of videos about varicocoele on YouTube.

Method: A cross-sectional study was conducted at Turkey in September 2020, and comprised YouTube videos related to varicocoele. The videos were divided into 2 groups according to their reliability and accuracy using the European Association of Urology Sexual and Reproductive Guidelines 2020. A 5-point modified reliability (DISCERN) tool, Global Quality Score, and Journal of the American Medical Association scores of each video were calculated. The user's engagements by total views, video-related comments, and "likes" and "dislikes" to the videos were compared. Data was analysed using SPSS 23.

Results: Of the 151 videos assessed, 73(48.34%) were included; 36(49.3%) reliable and 37(50.7%) unreliable. All scores were significantly higher for reliable videos ($p<0.05$). The mean number of views was 108448±90567 for reliable and 392626±895897 for unreliable videos ($p=0.044$). The rates of "likes" and "dislikes" were similar between the groups, whereas the comment rate was significantly higher for reliable videos ($p<0.05$). Most of the videos 40(54.8%) were uploaded by medical advertisements or for-profit companies, while those uploaded by universities or professional organisations were 19(26%).

Conclusion: Nearly half of the varicocoele-related videos on YouTube were unreliable, and the reliability of videos was not directly related to their popularity.

Keywords: Social media, Ethics, Misinformation, Varicocoele, Internet. (JPMA 72: 2427; 2022)

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Introduction

Varicocoele is defined as the abnormally dilated and tortuous veins of the pampiniform plexus. Most of the cases are unilateral and the left side is the most predominant location. Anatomical, histological and hormonal factors have been proposed to be related to varicocoele.[1-4] Clinical varicocoele is found in about 15% of the male population and up to 41% of infertile males, and represents the most common curable cause of primary and secondary infertility in males.[5-7] Recent studies have revealed that the spontaneous pregnancy rates increased significantly after micro-varicocoelectomy for infertility.[8] Due to its high incidence rates, many infertile couples have to deal with this frequent disease.

Infertility is defined as the inability to achieve a pregnancy with unprotected regular sexual intercourse within 12 months.[9] Childbearing is a big desire for many couples and the inability to have a child may be extremely distressing. At this period, couples look for any possible help to deal with their infertility problem. Video-streaming platforms (VSPs) are an important source for many patients to obtain detailed information about their diseases which is also a feasible platform for infertile patients. About 70% of adult internet users have searched the internet at some point for information related to healthcare, including specific diseases and their treatments.[10] International VSP platform YouTube is one of the internet sources that the patients may easily reach and get information about their diseases. It is the second most popular website in the world with more than 1.9 billion users and over 1 billion hours of videos watched daily.[11]

The main problem with VSP is the possible presence of misinformative data that may lead the patients to make the wrong decisions. It may be difficult for the patients to judge the reliability of information, and unreliable information may misguide the patients. Recent studies highlighted a significant misinformative content on YouTube about urological diseases, including premature ejaculation, erectile dysfunction and prostate cancer.[12-14] This may also be true for varicocoele treatment. Some of the researches related to varicocoele reported that individuals with varicocoele might seek alternative treatments instead of micro-varicocoelectomy which is the gold standard treatment for infertile males with abnormal sperm parameters.[5] The misinformative content of VSP might be responsible for this situation. As there is no control system related to VSPs, the scientific impact of these platforms must be evaluated.

The current study was planned to evaluate the scientific impact of mostly watched YouTube videos about the

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diagnosis and treatment of varicocoele, and to analyse the personal attitudes of YouTube users related to these videos.

Materials and Methods

A cross-sectional study was conducted at Turkey in September 2020 without seeking approval from the institutional ethics committee due to the study design. Video search for the diagnosis and surgical treatment of varicocoele was done using the key words; "varicocoele", "male infertility", "varicocoele treatment", "varicocoele diagnosis" and "varicocoele surgery". The search was carried out anonymously to minimise the possible bias related to user profiling techniques. The possible bias was further mitigated by using private browsing modes for all online searches. Most people have shown the tendency to click on a result within the very first pages of the search results.[15] As such, the current study preferred relevance-based ranking to sort the related videos.

The inclusion criteria were defined as videos in the English language with duration >20 seconds. The last updated version of the repeated videos was included. Videos not focussed on varicocoele and videos without audio were excluded. Also excluded were videos that contained only surgical techniques and no information about varicocoele.[16-18]

Every video was assessed using the validated DISCERN questionnaire which assesses the quality of information on treatment choices for health problems.[19] The evaluation process in terms of reliability and quality was performed by two independent researchers. In case of any discrepancy, a third researcher was involved. Inter-rater reliability was determined through kappa statistics.

The videos were divided into 2 groups according to reliability and accuracy of information. This assessment was only relevant for the following points: indication of disclosures, type of video provider, the primary topic of the video, commercial bias, degree of misinformation, and reporting on conflicts of interest. Furthermore, Global Quality Score (GQS), which includes a 5-point scale, was also used to determine the overall quality of the videos, ranging from 1 = poor quality to 5 = excellent quality. This tool incorporates the accessibility of the information within the video, quality of the information, and overall flow of information.[20]

Also used was the Journal of the American Medical Association (JAMA) scoring system which measures the quality of online information using four distinct criteria — authorship, attribution, disclosure and currency — to determine video accuracy and reliability.[21] A score of 4 indicates higher video scientific power and reliability, while a score of 0 indicates lower video scientific power and reliability. The users' engagement by total views, video-related comments, and "likes" and "dislikes" to the videos were recorded. The videos were also categorised according to the presence of advertisement, peer-to-peer medical advice, and/or signs of social support.

Data was analysed using SPSS 23. Descriptive statistical analysis with frequencies and percentages was performed and the data was expressed as mean ± standard deviation or medians, as appropriate. For the evaluation of normality of data, visual graphs like histograms, and appropriate statistical tests, like Kolmogorov-Smirnov and Shapiro-Wilk, were used. T-test and analysis of variance (ANOVA) were used to analyse parametric data. Mann-Whitney U, chi-squared and Kruskal-Wallis tests were used for the analyse of nonparametric data. In all analyses, $p<0.05$ was set as the marker for statistical significance.

Results

Inter-rater reliability was positive with kappa coefficient 0.89. Intraclass correlation coefficient was 0.91 for DISCERN, 0.90 for GQS, and 0.88 for JAMA.

Of the 151 videos assessed, 73(48.34%) were included; 36(49.3%) reliable and 37(50.7%) unreliable. Characteristics of the two categories were noted (Figure).

All scores were significantly higher for reliable videos ($p<0.05$). The mean number of views was 108448±90567 for reliable and 392626±895897 for unreliable videos ($p=0.044$). The rates of "likes", "dislikes" and comments were not significantly different between the groups (Table-1).

Most of the videos 40(54.8%) were uploaded by medical advertisements or for-profit companies, while those uploaded by universities or professional organisations were 19(26%). The reliability of videos according to the source of uploading was not significantly different

Table-1: Characteristics of YouTube videos.

	Reliable N=36	Non-reliable N=37	P value
DISCERN score	34.77±9.51	27.74±9.38	0.009
GQS score	2.85±1.01	1.96±1.03	0.003
JAMA score	2.19±0.81	1.74±0.59	0.031
Mean views(n)	108448±90567	392626±895897	0.044
Video length (sec)	475±357	231±199	0.047
Likes(%)	88.4	89.3	0.817
Dislikes(%)	11.6	10.7	
Comments(%)	0.112	0.038	0.013

DISCERN: A 5-point modified reliability tool, GQS: Global Quality Score, JAMA: and Journal of the American Medical Association.

Table-2: Analysis of videos by the source of upload.

	Healthcare Professionals	Health Information Websites	Profit Companies	Individual	P value
DISCERN Score	36.57±9.45	28.19±6.42	31.29±7.39	24.59±8.41	0.677
GQS Score	2.78±1.17	1.96+-0.87	2.21+-1.08	1.27±0.71	0.059
JAMA Score	2.27±0.72	2.16±0.89	1.85±0.97	1.51±0.64	0.721
Number(n)	19 (26%)	5(7%)	40 (55%)	9(12%)	
Reliability of Videos					
Reliable	13(68.4)	3(60)	16(40)	4(44.4)	0.618
Non-Reliable	6(31.6)	2(40)	24(60)	5(55.6)	
Mean views	192752±45190	201268±81568	313160±879106	247995±144977	0.819
Video length (sec)	491±262	394±241	266±293	505±434	0.525
Likes(%)	92.3	88.9	87.1	92.9	
Dislikes(%)	7.7	11.1	12.9	7.1	0.972
Comments(%)	0.092	0.054	0.036	0.051	<0.001

DISCERN: A 5-point modified reliability tool, GQS: Global Quality Score, JAMA: and Journal of the American Medical Association.

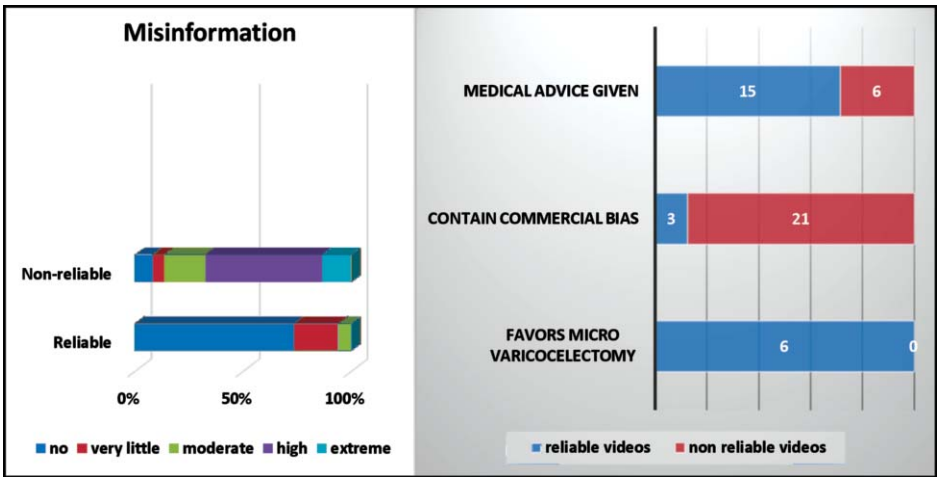

Figure: Characteristics of the reliable and non-reliable videos.

(p=0.618) In terms of intended audience, 49(67.1%) videos were prepared for the general population, 17(23.2) for healthcare providers and 7(9.6%) for patients, and the differences were not significant (Table-2).

The rates of "likes" or "dislikes" according to the source of uploading were similar (p=0.972), but the rate of comments for videos uploaded by healthcare professionals was significantly higher than for videos uploaded by for-profit companies (p<0.001).

Discussion

Varicocoele is one the most common causes of male infertility. The incidence of clinical varicocoele may reach up to 81% in secondary infertile men.[5,7] Infertility is an exhausting situation that leads to significant depression and anxiety in couples.[22] As varicocoele is a curable cause of infertility, several studies reported an increased rate of spontaneous pregnancy after micro-varicocoelectomy.[8] Infertile couples do not hesitate to search for any possible solutions for their problem. For this reason, they may also search various VSPs, especially YouTube, to get information about their clinical situation. Social media platforms can be powerful tools for healthcare providers to reach patients and give scientific information.[23] On the other hand, VSPs may also contain non-reliable information which may misguide the patients. Several studies have pointed out a number of inaccurate and unreliable health-related videos on YouTube.[24,25] The videos which were included in the current study had >13 million views in total. This data showed that varicocoele is a popular topic on YouTube. On the other hand, unlike other urological diseases, like benign prostate hyperplasia, bladder cancer, urinary system stone diseases, and prostate cancer, there is a very limited number of studies evaluating the reliability of YouTube videos about varicocoele.[12,24-26] To our knowledge, the current study is the first systematic analysis with validated instruments evaluating the online information about varicocoele on YouTube.

Videos prepared by healthcare professionals had the highest scientific power related to reliability which is similar to previous studies.[13,17,18] On the other hand, individual-based videos had the lowest reliability scores, which has also been reported earlier.[18] Audiences must be careful about considering the reliability of the information in a video according to the video source. The videos that were prepared by professional sources had more reliable information compared to individual-based

sources. Even the videos that were prepared by for-profit companies had higher reliability scores compared to individual-based videos. The obligations and the responsibilities of healthcare professionals and health-related companies lead them to prepare more scientific videos. We believe that defining this inter-source reliability difference is very important for the audience in terms of reaching precise scientific information. The number of views was significantly higher for unreliable videos compared to reliable videos, as has been reported earlier.[12-14,24-26] This showed that a significant portion of audiences had information about varicocoele from unreliable videos. It should be taken into consideration that the videos prepared by healthcare professionals may not be always reliable. The popularity of the videos did not mean that the video was scientifically reliable. There were several videos on YouTube claiming that yoga, herbal supplements or chair exercises are the treatment options for varicocoele, which, scientifically, is non-sense. The viewers could consider this information as a scientific fact and could delay their actual treatment. For that reason, the videos related to health must be under the control of the authorities and the videos that have disinformation must be forbidden.

Although the difference was not significant, the mean number of views for videos prepared by individual and for-profit companies was nearly two times higher than the videos prepared by healthcare professionals. This data showed that individual and profit-based videos related to varicocoele were more attractive for the audiences similar to premature ejaculation videos on YouTube.[13] This might be related to the content and visual attractivity of the videos. As usual, healthcare professionals had to give scientific information in a scientific language which might be boring for the audiences. On the other hand, individual or for-profit company videos aim at attracting audiences and use more visual activities. For such videos, scientific quality might be of secondary importance. We believe that to compete with individual and for-profit videos, healthcare professionals must prepare more interesting videos with visual context and animations. Technical videos demonstrating surgical approaches might be complex for the patients and need to be simplified. Scientific animations with a simple language might also increase the interest of the audiences which helps healthcare providers to reach their audience.

The current study also analysed the audiences' reactions to the videos. The rate of "likes", "dislikes" and "comments" might help understand the attitude of personal behaviours about the videos. The "likes" and "dislikes" rates of the videos were similar in respect to the video provider, demonstrating that the scientific strength of the video did not have a significant impact. The healthcare providers must be aware of this reality and try to prepare informative videos more professionally.

The rate of comments for reliable videos was significantly higher than the unreliable videos, which has been reported earlier.[27] Several factors, like socio-cultural characteristics, educational status, or clinical characteristics of the audiences might affect the comment rates. Since the current study did not have any information about the features of the audiences, it is in no position to give a scientific explanation on the issue.

The current study had some limitations. It tried to search the videos using some key words which might not cover all the related videos on YouTube. On the other hand, there is not a standard searching method for such studies and it tried to evaluate numerous videos to prevent possible bias. Another limitation was related to the dynamic changes of related videos at the VSP. The quality of the videos might be different at other time intervals. On the other hand, the current study tried to evaluate the videos uploaded recently. Another limitation was related to the language of the videos Which was limited to English language.

Conclusion

A large number of videos about varicocoele are available on YouTube, but some of them are commercial, biased and misinformative. The reliability of videos was not directly related to the popularity of the videos. Even videos with the low score of reliability might have a significant number of views. Healthcare professionals must create more attractive videos to gain the attention of the audiences. Health-related videos must be under the control of the authorities and misinformative and unreliable videos must be forbidden.

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