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A quality analysis of scintigraphy videos on YouTube

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Abstract

Aim: Scintigraphy is an important nuclear medicine imaging method that is used for detecting various pathological conditions and provides very useful functional information for clinicians. YouTube is the website that patients commonly use to get any information. This study aims to examine the scintigraphy related videos on YouTube.

Materials and Methods: This study was conducted in June 2023. Videos were accessed using the keyword "scintigraphy" on YouTube. These videos were evaluated using the Journal of the American Medical Association (JAMA) benchmarks, global quality scale (GQS) and the DISCERN scale.

Results: All videos accessed using the keyword "scintigraphy" on YouTube were reviewed. The study includes twenty-six of the examined videos. The source of most of the videos was non-physician. Physician-sourced videos had higher Discern scores, JAMA scores, and the number of likes and comments. However, those who were followed the most and had the highest view ratio were of non-physician-sourced. Physician-sourced videos were of higher quality than non-physician-sourced videos in the quality review (p: 0.015). Furthermore, the GQS score, DISCERN score and JAMA score were positively correlated.

Conclusion: Patients and caregivers can use YouTube for any disease and treatment. For this reason, official videos should be uploaded to the YouTube platform so that patients can access qualified, complete and accurate content. The URLs of these videos can be added to the patient information forms as QR codes.

Introduction

Access to the Internet is easier today with the spread and technological development of service providers, computers and smart phones. Therefore, it is common to search online websites that can provide free and fast access to information. Some studies have found that nearly four-fifths of internet users use the internet to get medical information [1-3]. Several studies have shown that nearly three-quarters of internet users search about their illness online and affected accordingly [4,5]. However, information may not be relevant, accurate, complete or objective [2,6]. YouTube is a site that uploads new videos continously and people who use the web frequently use YouTube to get information [7]. However, the acceptance mechanisms in the video upload phase may not be sufficient. So, there may be suspicions about the objectivity, quality, reliability and precision of the uploaded content. This situation raises concerns about YouTube, which has an important place in sharing free medical information [2].

Scintigraphy is a nuclear imaging technique used to detect gamma rays emitted from radiopharmaceuticals given to patients. Scintigraphy provides important functonal information for detecting various pathological conditions in patients.

The method, operation and information of the scintigraphy procedures are explained to the patients by the physician. Since it is less common than radiological examinations, it may not be fully understood and imagined by patients. Patients relativly have little knowledge about scintigraphic imaging methods. Before the scintigraphic procedures, the information form about the procedure is signed by the patient. This form contains information about the rationale for the procedure, possible side effects and radiation protection rules. However, some patients and/or caregivers may be concerned about procedure and may need more information. For this purpose, they can easily access free information using the internet. The quality of medical videos on YouTube has been studied in various diseases [8-18]. As far as we know, a similar study examining YouTube videos about scintigraphy hasn't been conducted yet.

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The current study aims to evaluate the quality of video content by analyzing YouTube videos about scintigraphy. Investigation the reliability and quality of YouTube videos on scintigraphy can raise awareness about uploading scientifically reliable video content and may canalize patients and caregivers to the right sources.

Materials and Methods

The current study was cross-sectional and 'YouTube' video sharing site was used. The term "scintigraphy" was used to search for YouTube videos in June 2023. The "video" and "sort by view count" options were used as search details and all retrieved URLs are saved. All videos were evaluated by a physician experienced in nuclear medicine and scintigraphy. In these searches, a newly opened account was used in order not to be affected by the existing algorithms of Youtube to adapt the videos to certain people. All videos related to scintigraphy were included except duplicate videos, videos of animal scintihgraphy, inaccessible videos, videos without scintigraphic content, and videos in languages other than English.

Time since the video was uploaded (days), duration of the video (seconds), total comments, annual comments, total views, likes and dislikes, video views [views/day], video likes/(likes+dislikes) ×100] noted pending the assessment procedure. In addition, video power index (VPI) [like rate×view rate/100] was used to reveal the popularity stage of videos. The videos were evaluated in two categories according to their sources: physician-sourced and non-physician-sourced. Global Quality Scale (GQS), the DISCERN Scale, and Journal of the American Medical Association (JAMA) benchmarks the were used to analyz video's quality.

GQS is a 5 point tool used to assess the ease of use, quality, and flow for the video content; four to five points define high quality, three points define intermediate quality, and one to two points define low quality [19].

The DISCERN scale is a tool consisting of questions about reliability, treatment options, and the overall content's quality. There is a range of score from zero to eighty points [20].

JAMA benchmark criteria includes the parameters of validity, disclosure, attribution and authorship. Finding each criterion is given one point. JAMA is used to assess the video accuracy and reliability. Four points defines higher accuracy and reliability, Zero point demonstrated poor accuracy and reliability [21].

Our study does not require local ethics committee approval. Because there were no human or animal participants in our study. And the videos we reviewed were publicly available. The literature includes similar studies with similar protocols [9,12,18].

Statistical Package for the Social Sciences (IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp) was used for statistical analysis. Descriptive statistics specified percentages (%) and numbers for categorical variables. For the continuous variables that was normally distributed, standard deviation and mean were specified. For continuous variables that did not show normal distribution the median was specified. The variables' conformity to the distribution of normally was examined using analytical methods (Shapiro-Wilk /Kolmogorov-Smirnov test), probability charts, and histograms. Quantitative data according to the normal distribution characteristics were evaluated with the Student's t-test or Mann Whitney U test. Qualitative data were analysed with the chi-square test. A two-sided p-value of 0.05 or less was chosen as the statistical significance level.

Results

In our study, all of the videos that searched for "scintigraphy" on YouTube were evaluated. A total of twenty-six videos were included in the study according to inclusion and exclusion criteria. The number of dislikes was zero for all videos included in our study. For this reason, the rate of likes and the video power index could not be evaluated and only view ratio was used instead. 19% and 81% of these videos were physician and non-physician sourced, respectively. The GQS scores of the examined videos were calculated and were seperated into three groups. The number of low quality, intermediate quality and high quality videos were 4,11 and 11, respectively. Information about the content and source were summarized in Table 1.

The analyzed data of the videos according to the quality groups were summarized in Table 2. The videos with the most views, comments, likes, and annual comments were high-quality group. View ratio was higher in the intermediate quality group. However, none of these were statistically significant. High quality group have statistically signitificant higher JAMA scores, Discern 1 scores, Discern 2 scores, Discern 3 scores and Total Discern scores compared to other groups.

Time since the video was uploaded (days), length in seconds, the number of views, comments, likes, annual comments, the viewing rates, Jama scores, GQS scores, Discern scores and quality groups are summarized in Table 3.

All of the physician-sourced videos were high quality. 15.4% of the videos from non-physician sources were low quality, 42.3% were intermediate quality, and 23.1% were high quality. There was statistically significant difference between physician and non-physician-sourced videos according to the quality groups (p: 0.015).

The number of comments, likes, annual comments and the JAMA scores of the physician sourced videos were found to be higher than the non-physician sourced videos. The number of views, and view ratio were higher in non-physician sourced videos. However, there wasn't statistically significant difference in these comparisons.

The GQS scores, Discern 1 scores, Discern 2 scores, Discern 3 scores, and Total Discern scores of non-physician-sourced videos were statistically significantly lower than physician-sourced videos.

In our study, correlation analyzes were also performed. Positive correlation was found between JAMA score and Total Discern score (r:0.518, p:0.007). A moderate positive correlation was found between JAMA score and GQS score (r:0.619, p:0.001). There was a high level of positive correlation between the GQS score and the Total Discern score (r:0.785, p:<0.001) (Table 4). In the correlation analyzes performed with the JAMA score, GQS score, Total Discern scores separately, no significant relationship was

Table 1. General informations of the videos.

Contents of videos, n (%)		Topics of videos, n (%)	
What is this imaging?	4 (15.4)	Brain scintigraphy	1 (3.8)
How to imaging?	3 (11.5)	Gastrointestinal scintigraphy	3 (11.5)
Where to use?	3 (11.5)	Labeled leukocyte scintigraphy	1 (3.8)
What to do before, during and/or after?	6 (23.1)	Bone scintigraphy	7 (26.9)
Comprehensive information	10 (38.5)	Myocardial perfusion scintigraphy	2 (7.7)
Sources of videos, n (%)		Pulmonery scintigraphy	1 (3.8)
Physician	5 (19.2)	Renal scintigraphy	4 (15.4)
Nuclear Medicine	4 (15.4)	General scintigraphy	5 (19.2)
Rheumatology	1 (3.8)	Salivary gland scintigraphy	1 (3.8)
Non-physician	21 (80.8)	PYP scintigraphy for amyloidosis	1 (3.8)
Nurse	1 (3.8)	Video uploaders, n (%)	
Technician	11 (42.3)	Hospital	7 (26.9)
Language therapist	1 (3.8)	Company	2 (7.7)
Representative	2 (7.7)	Channel	16 (61.5)
Youtuber	6 (23.1)	Association	1 (3.8)

found with the view ratio and the number of comments, annual comments, likes and views.

Discussion

Scintigraphy is an important nuclear medicine imaging method that is used for detecting various pathological conditions and provides very useful functional information for clinician. Patients referred for scintigraphy imaging worry about both the unusual imaging procedure and their own health at the time of appointment. For this reason, they seek more than the oral and written information given and want to learn more about this different type of imaging that causes radiation exposure. For this purpose, they mostly search on platforms such as YouTube.

In this study, videos about scintigraphy on YouTube were evaluated and analyzed. We divided the videos into quality groups according to their GQS scores. Videos with four to five points as high quality, three points as medium quality, and one to two points were rated as low quality. In the study that Youtube videos were examined as a information's source for ankylosing spondylitis, most of the videos (48.2%) were in high quality group [12]. In another study, Koçyiğit et al. examined Youtube videos about rheumatic diseases and COVID-19. It was determined that 41.4% of the videos were in the group of high quality [11]. Similar to these studies, we found that 42.3% of the videos in our study were of high quality. Contrary to these findings, there are some studies in which most of the videos are evaluated as low quality and medium quality [10,14-16].

In the study of Koçyiğit et al., video quality groups were found to be similar in terms of the number of comments, likes and views. However, between the groups there was a significant difference in terms of DISCERN score [12]. Since the DISCERN score also reflects the video quality, between the groups, a significant difference is an expected finding. In a study of YouTube videos on myofascial pain syndrome, the most watched and liked videos were of medium quality. The least liked and least viewed videos in that study were of high quality [14]. In Şan's study [16], in which he examined YouTube videos on radioactive iodine treatment, the videos with the highest Video Power Index value and the most liked and commented were found in the medium quality group. In that study, the group with the lowest popularity, views and likes was the high quality group, the highest view ratio was in the medium quality group, while the comments' number, the likes' number, the views's number, and the annual comments's number of were the highest in the high quality group in our study. Although, these differences between quality groups were not statistically significant in our study. Consistent with our findings, Zengin et al. examined YouTube videos on musculoskeletal ultrasound training and found that the group with the most likes was the high-quality video group [18]. Inconsistent with our findings, they found medium quality videos as the most watched videos in their study.

In our study, the source of the majority of the videos was non-physician. The comments' number, the likes' number, the annual comments' number, and the JAMA scores of the videos with physician sources were found to be higher than the non-physician sourced videos. The views' number and view ratio were higher in non-physician sourced videos. JAMA scores and DISCERN scores of physician-sourced videos were found to be statistically significantly higher than non-physician-sourced videos.

In a study about the quality of YouTube videos on radionuclide treatments [15], the highest quality videos were found to be physician-sourced which is inline with our findings. Also DISCERN scores, GQS scores, and JAMA scores were found to be higher in physician-sourced videos. Contrary to our data, the number of average views, comments, annual comments, and the video likes of physician-sourced videos were lower than non-physician-sourced videos.

In another study, 56 YouTube videos about radioactive iodine therapy were evaluated [16]. Similar to our study, the number of views and view ratio of physician-sourced videos were found to be lower than non-physician-sourced videos. In this study, a classification was made according to video languages. While the number of views, likes,

Table 2. General features of videos according to quality.

	Quality			
	Low	Intermediate	High	p value
Time after upload (day)				
Mean ± SD	2995 ± 1588	1284 ± 1069	1780 ± 1100	0.107
Range	846 – 4244	259 – 3142	501 – 3524	
Video duration (second)				
Mean ± SD	106 ± 27	147 ± 90	412 ± 224	0.001
Range	78 – 133	54 - 331	142 - 924	
Number of video views				
Mean ± SD	13871 ± 16680	18097 ± 43200	10211 ± 16979	0.651
Range	157 - 36193	96- 144770	21 – 52555	
Number of comments				
Mean ± SD	2.00 ± 2.82	2.27 ± 5.13	6.18 ± 10.00	0.427
Range	0 – 6	0 – 16	0 – 29	
Number of video likes				
Mean ± SD	62.75 ± 76.04	66.45 ± 129	70 ± 97	0.924
Range	0 – 167	0 – 419	0 – 247	
Number of comments per Year				
Mean ± SD	0.25 ± 0.40	1.78 ± 4.78	3.55 ± 7.46	0.604
Range	0 – 0.86	0 – 16	0 – 22	
View Ratio				
Mean ± SD	3.85 ± 4.16	10.74 ± 18.10	5.22 ± 8.63	0.724
Range	0.19 – 8.53	0.09 – 52.79	0.02 – 25.98	
JAMA score				
Mean ± SD	2.00 ± 0.00	2.54 ± 0.52	3.00 ± 0.44	0.006
Range	2 – 2	2 – 3	2 – 4	
Discern Part 1				
Mean ± SD	15.00 ± 3.55	17.54 ± 3.88	24.63 ± 4.29	0.001
Range	10 – 18	11 – 22	15 – 29	
Discern Part 2				
Mean ± SD	13.25 ± 4.99	14.45 ± 3.72	22.18 ± 4.66	0.004
Range	9 - 20	9 - 20	16 – 29	
Discern Part 3				
Mean ± SD	2 ± 0.70	2.90 ± 0.70	4.09 ± 0.83	0.001
Range	1 – 3	2 – 4	3 – 5	
Total Discern score				
Mean ± SD	30.25 ± 7.13	34.90 ± 6.54	50.90 ± 8.99	0.001
Range	22 - 38	23 – 43	34 - 63	

SD standard deviation, JAMA Journal of the American Medical Association benchmark criteria, GQS global quality scale.

comments and the annual comments for English videos were higher than Turkish videos, there wasn't difference between Discern scores, GQS scores, and JAMA scores. Since we only evaluated videos in English in our study, we could not make a comparison on this subject.

The role of YouTube videos in informing patients with myofascial pain syndrome was examined in one study [14]. In this study, contrary to our study, physician-sourced videos were the most watched videos. However, in the same way as our findings, the videos with the most comments in this study were found to be physician-sourced.

YouTube is a social platform that may not require any payment. Anyone can upload videos with any content. As in every field, there are many videos containing medical information that are not checked for accuracy [2]. Uploading medical videos must go through certain audit procedures

Table 3. General features of videos.

	Video Source			
	All (n:26)	Physician (n:5)	Non-physician (n:21)	p value (physician vs. non-physician)
Time after upload (day)				
Mean ± SD	1757 ± 1260	1789 ± 1043	1749 ± 1329	0.801
Range	259 – 4244	501 – 3213	259 – 4244	
Video duration (second)				
Mean ± SD	253 ± 207	468 ± 291	202 ± 149	0.019
Range	54 – 924	193 – 924	54 – 636	
Number of video views				
Mean ± SD	14111 ± 30148	8794 ± 12683	15377 ± 33093	0.527
Range	21 – 144866	232 – 29318	21 – 144866	
Number of comments				
Mean ± SD	3.88 ± 7.45	6.20 ± 9.44	3.33 ± 7.07	0.447
Range	0 – 29	0 – 22	0 – 29	
Number of video likes				
Mean ± SD	67 ± 105	85 ± 106	63 ± 108	0.613
Range	0 – 419	1 – 202	0 – 419	
Number of comments per year				
Mean ± SD	2.29 ± 5.73	4.70 ± 9.67	1.72 ± 4.54	0.409
Range	0 – 22	0 – 22	0 – 16	
View Ratio				
Mean ± SD	7.35 ± 13.11	7.26 ± 11.12	7.37 ± 13.79	0.659
Range	0.02 – 52.79	0.11 – 25.98	0.02 – 52.79	
JAMA score				
Mean ± SD	2.65 ± 0.56	3 ± 0	2.57 ± 0.59	0.157
Range	2 – 4	3-3	2 – 4	
GQS				
Mean ± SD	3.46 ± 0.98	4.80 ± 0.44	3.14 ± 0.79	0.001
Range	2 – 5	4-5	2 – 5	
Discern Part 1				
Mean ± SD	20.15 ± 5.56	26.2 ± 2.77	18.17 ± 5.09	0.003
Range	10 – 29	23 – 29	10 – 28	
Discern Part 2				
Mean ± SD	17.53 ± 5.81	24.60 ± 5.31	15.85 ± 4.60	0.005
Range	9 – 29	16 – 29	9 – 24	
Discern Part 3				
Mean ± SD	3.26 ± 1.07	4.40 ± 0.89	3.00 ± 0.94	0.012
Range	1 – 5	3-5	1 – 5	
Total Discern score				
Mean ± SD	40.96 ± 11.56	55.20 ± 8.37	37.57 ± 9.50	0.002
Range	22 – 63	43 – 63	22 – 57	
Quality, n (%)				
Low	4 (15.4%)	0 (0.0%)	4 (15.4%)	0.015
Intermediate	11 (42.3%)	0 (0.0%)	11 (42.3%)	
High	11 (42.3%)	5 (19.2%)	6 (23.1%)	

SD standard deviation, JAMA Journal of the American Medical Association benchmark criteria, GQS global quality scale.

Table 4. Correlation relationship between JAMA, GQS and Total Discern.

	p	r
JAMA vs GQS	0.001	0.619
JAMA vs Total Discern	0.007	0.518
GQS vs Total Discern	< 0.001	0.785

JAMA Journal of the American Medical Association benchmark criteria, GQS global quality scale.

in order not to cause any misdirection. A filter may be used before the video uploading phase or video content can be evaluated with any of the parameters JAMA, GQS and DISCERN. It has been reported that there is a high level of positive correlation between these three parameters and video quality [13,15,16]. In our study, positive correlations were found between DISCERN score, GQS score and JAMA score consistent with the literature.

Because of the momentary stress of diseases and the anxiety of exposure to radiation can reduce attention and perception, the information given during the appointment about the scintigraphy procedure may not be effective. In addition, nuclear medicine imaging methods are less known than conventional radiology and patients can use social platforms such as YouTube, where they can access any information that may be inaccurate or incomplete. In our study, most of the YouTube videos were of non-physician sourced, and non-physician-sourced videos were of lower quality than physician-sourced videos. Contrary to all these, in our study, non-physician sourced videos were the most watched videos. But, in the literature there are some studies in which physician-sourced videos are in the majority [13]. In some studies, low quality videos and non-physician-sourced videos were evaluated as the most liked and most watched videos [15,16].

In the literature, there are studies stating that medium quality and low quality videos constitute the majority. In our study, although most of the videos we examined were in the group of high quality, the sum of low and medium quality videos was still higher (57.7%). This may lead them to access accurate and incomplete information with patients. There is sloppy control mechanism for uploading on YouTube platform. Medical videos must go through quality filter processes. In addition medical associations, may upload official videos so that videos with more accurate and complete content can be shared with people.

Limitations

In this study, there were some limitations. We searched 'scintigraphy' on the YouTube platform and reviewed all the videos. However, we were able to include only 26 videos in our study. There were many academic videos in languages other than English and a substantial number of videos about scintigraphy for animals. Although English is an universal language, there were many videos in other languages as well. Results may vary if videos in other languages are also included in the assessment. Despite everything, very few videos were obtained than expected. In addition, if the number of videos had been more, the findings might have been different.

Conclusion

YouTube is one of the most widely searched online platform that patients and caregivers can use to obtain infromation for any disease and treatment. For this reason, official videos have to be uploaded to the YouTube platform so that patients can access qualified, complete and accurate content. The URLs of these videos can be added to the patient information forms as QR codes.

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Ethical approval

This study does not require an ethics committee.

Informed consent

This study does not require patient consent.

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