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Does Most Watched YouTube Videos Related to Carpal Tunnel Syndrome Provide Sufficient Information?

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ABSTRACT

Purpose: The aim of this study was to evaluate the quality of the most watched YouTube videos regarding the diagnosis and treatment of Carpal Tunnel Syndrome.

Methods: The first fifty most watched videos for search term "Carpal Tunnel Syndrome" on YouTube, meeting inclusion criteria are included and evaluated by two researchers with DISCERN, JAMA and Carpal Tunnel Syndrome Informational Assessment (CTSIA) scores, under the groups of physicians, health channels and other sources.

Results: There were statistically significant positive correlation between scoring systems, including CTSIA. No statistically significant correlation was found between video source and number of views, and between video source and view rate. There was a relation between video source and DISCERN, JAMA, and CTSIA scores which was statistically significant ($p<0.05$). The videos uploaded by doctors and health channels had higher DISCERN scores than other sources ($p=0.025$ and 0.024, respectively), the videos uploaded by health channels had higher JAMA scores than other sources ($p=0.013$), and the videos uploaded by doctors had higher CTSIA scores than other sources.

Conclusion: Informational quality of videos about CTS is insufficient, even for physician videos although these are better than other sources. There is a clear need for guidelines and scoring systems for online medical information videos since internet is accepted and used as the ultimate information source.

Keywords: carpal tunnel syndrome, YouTube, patient education, medical informational video

Karpal Tünel Sendromu ile İlgili En Çok Seyredilen YouTube Videoları Yeterli Bilgi Sağlıyor mu?

ÖZET

Amaç: Bu çalışmanın amacı, Karpal Tünel Sendromu (KTS) tanı ve tedavisi ile ilgili en çok izlenen YouTube videolarının kalitesini değerlendirmektir.

Yöntemler: YouTube'da "Karpal Tünel Sendromu" arama terimi için dahil edilme kriterlerini karşılayan en çok izlenen ilk elli video dahil edilmiş ve DISCERN, JAMA ve Karpal Tünel Sendromu Bilgilendirme Değerlendirmesi (CTSIA) puanları iki araştırmacı tarafından, hekimler, sağlık kanalları ve diğer kaynaklar yönünden değerlendirilmiştir.

Bulgular: CTSIA'da dahil olmak üzere skorlama sistemleri arasında istatistiksel olarak anlamlı pozitif korelasyon vardı. Video kaynağı ile görüntüleme sayısı arasında ve video kaynağı ile görüntüleme oranı arasında istatistiksel olarak anlamlı bir ilişki bulunmadı. Video kaynağı ile DISCERN, JAMA ve CTSIA puanları arasında istatistiksel olarak anlamlı bir ilişki vardı ($p<0.05$). Doktorlar ve sağlık kanalları tarafından yüklenen videolar, diğer kaynaklara göre daha yüksek DISCERN puanlarına sahipti (sırasıyla $p=0.025$ ve 0.024). Sağlık kanalları tarafından yüklenen videolar diğer kaynaklara göre daha yüksek JAMA ($p=0.013$) ve doktorlar tarafından yüklenen videolar diğer kaynaklardan daha yüksek CTSIA puanlarına sahipti.

Sonuç: Diğer kaynaklardan daha iyi olmasına rağmen KTS ile ilgili videoların bilgi kalitesi hekim videoları için bile yetersizdir. İnternet, nihai bilgi kaynağı olarak kabul edildiğinden ve kullanıldığından, çevrimiçi tıbbi bilgi videoları için kılavuzlara ve puanlama sistemlerine açık bir ihtiyaç vardır.

Anahtar kelimeler Karpal tünel sendromu, YouTube, hasta eğitimi, tıbbi bilgilendirme videosu

Carpal Tunnel Syndrome (CTS) is entrapment of median nerve at wrist level and the most frequent compressive focal mononeuropathy. CTS affects approximately 3-12% of adult population (1). Symptoms may worsen during nighttime and include numbness in first three fingers, pain and thenar atrophy. Common risk factors for CTS are repetitive overuse, obesity, diabetes mellitus, pregnancy but most of the cases remains idiopathic. Diagnosis is based on physical examination, radiological assessment (ultrasonography, magnetic resonance imaging) and electrophysiological studies. Treatment options are patient education, conservative treatment (non-steroidal anti-inflammatory drugs, splinting), local injections and physiotherapy for early to mild disease and surgical (open or endoscopic) release for severe disease.

Today internet is highly accepted as the ultimate information source and almost all patients with opportunity to reach the internet, checks out their options and conditions online as a second opinion. In this manner YouTube is one of the first addresses that patients visit, with 122 million daily active users and more than 1 billion videos watched every day (2). This tendency raised a concern about the quality and accuracy of the medical informational videos hosted by YouTube since it is not a peer-reviewed platform (3). Recent studies conducted to evaluate the information quality on YouTube videos regarding CTS concluded that the information quality of these videos are low and lack of essential information such as complications and other treatment modalities (4,5). Another recent study by Goyal et al. (6) focused on the potential of YouTube videos about CTS to reinforce misconceptions. The authors identified a notable number of statements that may reinforce unhealthy misconceptions and they stated that more popular videos might mistakenly be assumed by patients that the information in these videos is more accurate and these videos are less likely to reinforce potential misconceptions.

Popularity of a video on YouTube depends on several parameters and calculated by an algorithm, but since these parameters include concerns other than medical issues popularity can be a misleading factor. Although abovementioned studies evaluated CTS videos on YouTube, their methodology was similar and included the first 50 or 60 relevant videos. A recent study by Mert and Bozgeyik (4) stated that useful and quality videos are in the background in terms of the number of views and likes and that videos with low quality are viewed more. To the best of our knowledge there is no study that evaluated the content quality of the most watched (highest number of views) videos related to CTS. The aim of this study was to evaluate the quality of the most watched YouTube videos regarding the diagnosis and treatment of CTS.

MATERIAL and METHODS

Videos available on YouTube on 09 January 2021 were searched using the keyword "Carpal Tunnel Syndrome" without changing default search options by using a web browser with cleared cache. The first 100 most watched videos were evaluated. Non-English, advertising content, less than 1 minute and longer than 20 minutes were excluded from the study. The fifty most watched videos meeting the appropriate criteria were included in the study.

The number of views, the time since the upload date, the number of views, the number of likes and the number of dislikes were recorded. Video strength index (VSI) values ((likes / dislikes - dislikes) * 100) were calculated to determine video popularity. Video length (sec), video source and video content were also noted.

The videos were watched separately by 2 orthopedic surgeons and evaluated independently according to the DISCERN, Journal of the American Medical Association (JAMA) and a novel scoring system, Carpal Tunnel Syndrome Information Assessment (CTSIA) which was designed by the authors. There were no statistically significant differences between the two authors in terms of the DISCERN, JAMA, and CTSIA scores (Table 1). In the event of a disagreement between the authors, reevaluations were performed until a consensus was reached. The authors of this study then made a final evaluation using the DISCERN, JAMA, and CTSIA scoring systems for further statistical analysis.

Table 1. Pearson Correlation Analysis of Author's Scores According to Video Quality Assessment Tools

	DISCERN Author1	DISCERN Author2
DISCERN Author1	1	**r=0.9687**
DISCERN Author2	**p<0.001***	1
	JAMA Author1	JAMA Author2
JAMA Author1	1	**r=0.369**
JAMA Author2	**p=0.008***	1
	CTSIA Author1	CTSIA Author2
CTSIA Author1	1	**r=0.9578**
CTSIA Author2	**p<0.001***	1

*r: correlation coeffiecient, p: significance, *: significant*

The DISCERN scoring system has 3 sections, with a total of 16 questions. These 3 sections include: 8 questions for the reliability assessment of information, 7 questions about treatment information, and 1 question to evaluate the general quality of information (Table 2). The JAMA scoring system consists of 4 criteria (Authorship, Attribution, Disclosure, Currency) with 1 point for each, with a maximum score of 4 points. The lowest quality information is 1 point and highest quality information is 4 points according to JAMA scoring system (Table 3). CTSIA is a novel scoring system consists of 7 sections (definition and pathoanatomy, risk factors and associated conditions, signs and symptoms, diagnosis, nonoperative treatment, operative treatment and complications) and the overall CTSIA score ranges between 0 and 10 (Table 4). CTSIA scores indicate low quality between 0 and 2.5 points, moderate quality between 2.6 and 5 points, high quality between 5.1 and 7.5 points, and very high quality between 7.6 and 10 points.

The relation between several parameters were statistically studied including: 1. Number of views and DISCERN, JAMA, and CTSIA scores, 2. View rate and DISCERN, JAMA, and CTSIA scores, 3. VSI rate and DISCERN, JAMA, and CTSIA scores, 4. VSI and view rate, 5. Video source and number of views, 6. Video source and view rate, 7. Video source and VSI, 8. Video source and DISCERN, JAMA, and CTSIA scores, and 9. Video length and DISCERN, JAMA, and CTSIA scores.

Descriptive data was used to define variables. Pearson's correlation coefficient was calculated to evaluate the relation between normally distributed continuous variables. As the parameters did not show normal distribution, the Kruskal-Wallis test was used in intergroup comparisons, and the Mann-Whitney U test (with Bonferroni's correction) in the identification of the group that caused the difference. The statistically significant level was set at 0.05, and the statistical analysis was performed with IBM SPSS Statistics 21.0.

Table 2. DISCERN Scoring System

DISCERN Scoring System						
		No	Partially			Yes
		1	2	3	4	5
Section-1: Is the publication reliable?						
1	Are the aims clear?					
2	Does it achieve its aims?					
3	Is it relevant?					
4	Is it clear what sources of information were used to compile the publication (other than the author or producer)?					
5	Is it clear when the information used or reported in the publication was produced?					
6	Is it balanced and unbiased?					
7	Does it provide details of additional sources of support and information?					
8	Does it refer to areas of uncertainty?					
Section-2: How good is the quality of information on treatment choices?						
9	Does it describe how each treatment works?					
10	Does it describe the benefits of each treatment?					
11	Does it describe the risks of each treatment?					
12	Does it describe what would happen if no treatment is used?					
13	Does it describe how the treatment choices affect overall quality of life?					
14	Is it clear that there may be more than one possible treatment choice?					
15	Does it provide support for shared decision-making?					
Section-3: Overall rating of the publication?						
16	Based on the answers to all of the above questions, rate the overall quality of the publication as a source of information about treatment choices.					

Table 3. JAMA (Journal of the American Medical Association) Scoring System

JAMA Scoring System	
Authorship	Authors and contributors, their affiliations, and relevant credentials should be provided
Attribution	References and sources for all content should be listed clearly, and all relevant copyright information should be noted
Disclosure	Website "ownership" should be prominently and fully disclosed, as should any sponsorship, advertising, underwriting, commercial funding arrangements or support, or potential conflicts of interest
Currency	Dates when content was posted and updated should be indicated

Table 5. Pearson Correlation Analysis of DISCERN, JAMA and CTSIA Scores

	DISCERN	JAMA	CTSIA
DISCERN	1	r=0.4815 p<0.001*	r=0.8415 p<0.001*
JAMA	-	1	r=0.3747 p=0.007*

*r: correlation coeffiecient, p: significance, *: significant*

Table 4. Carpal Tunnel Syndrome Informational Assesment (CTSIA) Scoring System

Carpal Tunnel Syndrome Informational Assesment Score				
No	**Essential Info**	**Components**	**Score**	**Subtotal Score**
1	Definition & Pathoanatomy (Max 2 pts)	Anatomy (0.5 pt)		
		Compression (1 pt)		
		Thickening of Flexor Retinaculum (0.5 pt)		
2	Risk Factor & Associated Conditions (Max 1 pt)	Repetetive Stress (1 pt)		
		Obesity (0.5 pt)		
		Pregnancy (0.5 pt)		
		Underlying Conditions (R.A., mass, etc.)(0.5 pt)		
3	Signs & Symptoms (Max 1 pt)	Numbness (1 pt)		
		Pain (0.5 pt)		
		Thenar Atrophy (0.5 pt)		
4	Diagnosis (Max 1 pt)	EMG(1 pt)		
		Radiologic Imaging (0.5 pt)		
		Physical Tests (0.5 pt)		
5	Non-Operative Treatment (Max 1 pt)	Splint&Rest (0.5 pt)		
		NSAID (0.5 pt)		
		Local Injections (0.5 pt)		
		PTR (0.5 pt)		
6	Operative Treatment (Max 2 pts)	Open Release (2 pt)		
		Endoscopic Decompression (2 pt)		
7	Complications (Max 2 pts)	Recurrence (1 pt)		
		Nerve Injury (1 pt)		
		Infection (0.5 pt)		
		Tendon Injury (0.5 pt)		
			Total Video Score	

RESULTS

The results of this study revealed that majority of the videos (28 videos, 56%) consisted of information about non-surgical treatment options. The remaining 22 videos were as following: Eight videos were about general information regarding CTS (16%), 6 videos were related to operative techniques in CTS surgery (12%), 7 videos were demonstrations of physical examination in CTS (%14), and 1 video was a patient experience after CTS surgery (2%). Of the 50 videos evaluated, 30 (60%) were uploaded by health channels, 8 (16%) were uploaded by physicians, 12 (24%) was uploaded by other sources.

The mean video length was 354.4 seconds (73-952 seconds), the mean number of views was 1609516.8 (187606-57033461), the mean time since the video was uploaded was 2403.1 days (275-4991 days), the mean view rate was 474.4 per day (42.2-11427.2 per day), the mean number of likes was 4743.4 (81-19968), the mean number of dislikes was 226.9 (7-2505), and the mean VSI value was 111.2 (100.7-298). The mean scores for JAMA, DISCERN, and CTSIA were 2.34 (1-4), 29.5 (16-71), and 2.9 (0.5-9), respectively.

Statistical analysis revealed statistically significant positive correlations between DISCERN and CTSIA scores (strong, $r=0.8415$, $p<0.001$), DISCERN and JAMA scores (moderate, ($r=0.4815$, $p<0.001$), and JAMA and CTSIA scores (weak, $r=0.3747$, $p=0.007$) (Table 5).

No statistically significant correlation was found between video source and number of views, and between video source and view rate ($p>0.05$). On the other hand, there was a relation between video source and DISCERN, JAMA, and CTSIA scores which was statistically significant ($p<0.05$). The videos uploaded by doctors and health channels had higher DISCERN scores than other sources ($p=0.025$ and 0.024, respectively), the videos uploaded by health channels had higher JAMA scores than other sources ($p=0.013$), and finally the videos uploaded by doctors had higher CTSIA scores than other sources ($p=0.045$). In addition, there was also a statistically significant relation between video source and VSI values ($p<0.05$). Videos uploaded by doctor had higher VSI values than other sources ($p=0.016$).

None of the video popularity parameters were found to be correlated with quality evaluation scores. There was no statistically significant correlation between DISCERN, JAMA, and CTSIA scores and number of views, view rates or VSI values ($p>0.05$). No statistically significant correlation was found between video length and DISCERN, JAMA, and CTSIA scores and video length ($p>0.05$). Although shorter 25 videos had lower DISCERN, JAMA and CTSIA scores than the longer 25 videos, the difference did not reach significance ($p>0.05$). DISCERN score was 28.56 vs. 30.52, JAMA score was 2.28 vs. 2.4, and CTSIA score was 2.6 vs. 3.3 for shorter vs. longer videos.

DISCUSSION

This study revealed that the most watched YouTube videos related to CTS are insufficient in quality in terms of DISCERN, JAMA and CTSIA scores. Although numerous studies evaluated the content quality of medical information of YouTube videos, almost all of these studies used the inclusion criteria of relevancy used by YouTube search engine and included the first 50-60 videos (7-9). The studies aimed to determine the information quality of YouTube videos on CTS were also designed in same methodology (4-6,10). Since these studies were conducted to evaluate the misinformation potential of these medical videos among viewers, we believe that the amount of distribution of misleading information is much more concerning than the relevancy issue. To reach this aim, the authors of this study included the first 50 most watched videos regarding CTS with an approximately 1.6 million mean number of views.

Of the 50 most watched videos only 16% were provided by physicians. The content quality of videos presented by physicians were higher regarding the mean DISCERN (37.6, 29.8, and 23.3 for physicians, health channels, and other sources, respectively), JAMA (2.5, 2.46, and 1.91 for physicians, health channels, and other sources, respectively), and CTSIA (4.25, 2.296, and 2.04 for physicians, health channels, and other sources, respectively) scores. Additionally, the difference was statistically significant for DISCERN (doctors and health channels had higher scores than other sources), JAMA (health channels had higher scores than other sources), and CTSIA scores (doctors had higher scores than other sources) ($p<0.05$). A recent study about CTS and several other studies on YouTube videos about medical topics revealed that physician videos are high in content quality, yet low in popularity (10-12). This might be the reason of relatively fewer number of physician videos in present study since the most watched videos focused on CTS were included. Adversely, DISCERN scores for medical centers found to be higher than other sources in a study by Ozdemir et al. (5), while there was no correlation between sources and quality scores in another (4).

Results of this study showed no relation between video source and number of views, and between video source and view rate (p>0.05). A study by Koller et al. (13) demonstrated that there was a negative correlation between physician videos and view rates. Both these findings are quite concerning because number of views and view rates seem to be independent from and/or negatively affected by the video source and the content quality. The viewer may be exposed to irrelevant or misleading information even in the most watched 50 videos about CTS. On the other hand, there was a statistically significant relation between video source and VSI values (p<0.05). Videos provided by physicians had higher VSI values than other sources. The higher interaction rates of physician videos may be a consequence of patients' need for seeking medical information from a health-care professional. Although patients' access to medical information is an advantage in terms of awareness, it has many disadvantages. Poor-quality health information may lead to false expectations, doctor-patient conflicts and cause mistrust (14,15). This underlines the importance of videos provided by physicians for patient information purposes.

Eight videos (16%) out of 50 were about general information on CTS. Most of the videos (56%) were about non-surgical treatment options. Despite, only 6 of all videos (12%) were about operative treatment. Radonjic et al. (10) reported that there were fewer non-surgical treatment videos in their study while the authors' used relevancy as an inclusion criteria. YouTube is a search platform for patients seeking an alternative way of treatment and may be used a tool to avoid surgery. Since our study included the most watched videos related to CTS, the relatively high number of non-surgical treatment videos might be interpreted as the reflection of this patient behavior.

The number of views for shorter 25 videos were noticeably higher than the longer 25 videos (2.77 million vs. 448117). Considering the data in the literature, it was found that the videos with animation content and shorter duration were more liked and watched (16). Additionally, the view rate was also considerably higher for the shorter videos (629.86 vs. 319.65). Although shorter videos had higher mean VSI values (117.13 vs. 105.35) the difference did not reach statistical significance (p>0.05). Moreover, all quality assessment scores were lower for shorter videos. These findings indicate that videos with shorter durations have higher popularity among watchers but lack of content quality. Therefore, the ideal patient information videos on medical issues should be planned thoroughly to cover all essential information but should be shorter in duration.

This study had some limitations. This study included videos in English language and limited to available videos on the search date. Additionally, we used an unvalidated tool, namely CTSIA score to evaluate content quality. There are also studies in the literature using unvalidated assessment tools (6,10,16) since this is a relatively new research area and there are no common or validated tools to use for evaluating the content quality of online medical videos. Although CTSIA is an unvalidated scoring system statistical analysis revealed that there was significant positive correlation with DISCERN scores. This correlation indicates that standardization of video assessment tools may be beneficial in producing high quality patient information videos.

CONCLUSION

The information quality of videos on YouTube related to CTS is insufficient even in the most watched videos. The videos provided by physicians is higher in informationally scores, yet lower in numbers. Physicians should be aware of the low-quality content in YouTube videos in order to guide patients to ideal sources of information and to avoid potential conflicts. Accepting the online platforms as the ultimate source of information in the modern world, the need for thorough and standardized scoring systems for producing patient information videos is undeniable.

DECLARATIONS

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Conflicts of Interest

No conflict of interest was declared by the authors.

Ethics Approval

This study is a retrospective online database cohort study and no human/animal individuals are subjected, therefore is out of scope of ethical board reviews.

Availability of Data and Material

The authors confirm that the data supporting the findings of this study are available within the article [and/or] its supplementary materials.

Authors' Contributions

All authors contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

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