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Evaluation of the Reliability, Utility, and Quality of the Information in Testicular Cancer Self-exam Videos Shared on YouTube

You Tube'da Paylaşılan Testis Kanseri Kendi Kendine Muayene Videolarındaki Bilgilerin Güvenilirliği, Kullanışlılığı ve Kalitesinin Değerlendirilmesi

Tuncay TAŞ[a], Ersan ARDA[b], Basri ÇAKIROĞLU[c], Taha UÇAR[d]

[a]Department of Urology, İstanbul Cerrahi Hospital, Nişantaşı University College of Health Sciences, İstanbul, TURKEY
[b]Department of Urology, Trakya University Faculty of Medicine, Edirne, TURKEY
[c]Department of Urology, Hisar Intercontinental Hospital, İstanbul, TURKEY
[d]Department of Urology, İstanbul Medeniyet University Faculty of Medicine, İstanbul, TURKEY

ABSTRACT Objective: The aim of this study was to assess the testicular cancer self-examination (TSE) videos on YouTube. **Material and Methods:** This study was conducted to evaluate the content, reliability and quality of internet videos related to TSE. The search engine of YouTube® was queried for the keyword 'TSE' in April 01, 2019. Videos were scaled according to the time since upload day, running time, number of comments and number of like/dislike. All videos were also categorized according to source into 3 groups: Health information websites/TV programs; independent users; university channels/medical professionals. DISCERN questionnaire score (DISCERN) Journal of the American Medical Association benchmark criteria (JAMAS), Global Quality Scores (GQS), TSE-Comprehensiveness (TSE-C) and Video Power Index (VPI) were used. **Results:** Total of 68 videos were included and 32 of videos were excluded due to being unrelated or repeated. When VPI values were examined according to the video source, there was no statistically significant difference (p>0.05). According to the video source, there was a statistically significant difference in terms of DISCERN scores (p=0.049) and TSE-C scores (p=0.019). DISCERN scores of the videos whose source is university channels/medical professionals are higher than the DISCERN scores of the videos whose source is independent users (p=0.042). There was a statistically significant difference in terms of JAMAS scores (p=0.009). **Conclusion:** It is concluded that the information of TSE videos on YouTube is a weak source when evaluated in terms of reliability, benefit and quality.

Keywords: Internet; self-exam; testicular cancer, You Tube

ÖZET Amaç: Bu çalışmanın amacı, YouTube'da testis kanseri kendi kendine muayene (TSE) videolarını değerlendirmekti. **Gereç ve Yöntemler:** Bu çalışma, TSE ile ilgili internet videolarının içeriğini, güvenirliğini ve kalitesini değerlendirmek amacıyla yapılmıştır. YouTube® arama motorunda 01 Nisan 2019'da "TSE" anahtar kelimesi sorgulandı. İlk 100 video değerlendirildi. Videolar, yüklendiği günden beri geçen süre, video süresi, yorum sayısı ve beğenme/beğenmeme sayılarına göre ölçeklendirildi. Tüm videolar da kaynağa göre sağlık bilgilendirme web siteleri/TV programları; bağımsız kullanıcılar ve üniversite kanalları/tıp uzmanları olarak 3 gruba ayrıldı. Tüketici Sağlığı Bilgileri Kalite Kriterleri (DISCERN), Amerikan Tabipler Birliği Dergisi Karşılaştırma Kriterleri (JAMAS), Küresel Kalite Puanı kriterleri (GQS), TSE-Kapsam (TSE-C) ve Video Güç İndeksi (VPI) kullanıldı. **Bulgular:** Toplam 68 video dahil edildi ve 32 video alakasız olması veya tekrarlanması nedeniyle çıkarıldı. Video kaynağına göre VPI değerleri incelendiğinde istatistiksel olarak anlamlı fark yoktu (p>0,05). Video kaynağına göre DISCERN puanları (p=0,049) ve TSE-C puanları (p=0,019) açısından istatistiksel olarak anlamlı bir fark vardı. Kaynağı üniversite kanalları / tıp uzmanları olan videoların DISCERN puanları, kaynağı bağımsız kullanıcılar olan videoların DISCERN puanlarından daha yüksekti (p=0,042). JAMAS puanları açısından istatistiksel olarak anlamlı farklılık vardı (p=0,009). **Sonuç:** YouTube'daki TSE videolarının bilgilerinin güvenilirlik, fayda ve kalite açısından değerlendirildiğinde zayıf bir kaynak olduğu sonucuna varılmıştır.

Anahtar Kelimeler: İnternet; kendi kendine muayene; testis kanseri, You Tube

Testicular cancer, which is increasing worldwide for unknown reasons, is the most common malignancy in men aged 15-45. Males born with cryptorchidism, have a family history or personal testicular tumor history, are much more likely to be diagnosed with testicular cancer.[1] In the absence of

Correspondence: Tuncay TAŞ
Department of Urology, İstanbul Cerrahi Hospital, Nişantaşı University College of Health Sciences, İstanbul, TURKEY/TÜRKİYE
E-mail: drtastuncay@gmail.com

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preventive measures early detection, that can be provided with testicular cancer self-examination (TSE), is the mainstay of effective treatment. If the patient has certain risk factors for predisposing testicular cancer, he should be informed by the physician and do a TSE monthly by himself.[2]

In the American Urological Association (AUA)'s Men's Health Checklist, written by AUA board of directors, TSE is classified as in the United States Preventive Services Task Force (USPSTF) level of evidence insufficient/poor but may be indicated with symptoms and/or higher risk cases.[3]

Testicular self-examination does not require any special preparation. It is checked whether there is any stiffness in the testicle by using both hands, placing the second and third fingers under the testicle and first fingers on the top, during or after a warm shower while standing.[2] Along with a very simple training, it has important advantages such as being easily applied by anyone, not requiring any special equipment and being done in a short time.

Social media websites are increasingly used as a popular health information source, especially by young adults. YouTube, which is the second most popular website after Google according to Alexa Internet, has become an important source by letting users to upload educational videos.[4] However, publishing these videos without a review of a specialist causes a big drawback in regards of reliability for this information.[5-7] Blind authorship, not referring any scientific resources, and the presentation of an opinion as a real fact can be considered as other disadvantages.[6] YouTube and internet are used by medical professionals for various reasons such as discussing patients with colleagues, sharing education materials, following congresses and reaching updated literature.[8]

Especially, with the COVID pandemic, which has influenced the whole world, medical publications on YouTube and social media platforms have increased significantly nowadays. The aim of this study was to evaluate the TSE videos on YouTube with previously described objective assessment tools in regards of reliability, usefulness, and quality.

MATERIAL AND METHODS

The search engine of YouTube®' (http:// www.youtube.com) was queried for the keyword 'testicular cancer self-examination' in April 01, 2019. All videos were about TSE and in English. The first 100 videos we come across were assessed by two urologists without discrimination of content. Both urologists who evaluate videos are particularly interested in urooncology. Multi-part, unrelated, inaudible, no image and copied videos were excluded. Videos were scaled according to the time since upload day, running time, number of comments and number of like/dislike. Videos were assessed in regards of the source and the publisher. All videos were also divided into 3 groups according to sources: Health information websites/TV programs; independent users, university channels/medical professionals. Since there was no intervention, the ethics committee permission was not obtained.

EVALUATING THE RELIABILITY, CONTENT, AND QUALITY

Various objective assessment tools are being used to evaluate reliability of healthcare information videos. DISCERN questionnaire score (DISCERN) Journal of the American Medical Association benchmark criteria (JAMAS), and Global Quality Scores (GQS) were used to assess the educational quality and accuracy of the online content.[9-12] Video Power Index (VPI) was used to assess view/like ratio for all the videos.[13] In our study, a more comprehensive evaluation of YouTube videos in terms of TSE was aimed using a scoring system called TSE-C. Modification of the original TSE edited by the American Cancer Society for patients with risk factors for testicular cancer while taking AUA and EAU guidelines into consideration and adapting them to this new scoring system.[14,15] The answer to the TSE-C questions was determined as 1 point if 'yes', and 0 points if 'no'. With a form containing 6 questions, whether the information about how the exam should be, information including whether risk factors are described or not, and the accuracy of the information were evaluated (Table 1).

Assessment of the reliability of the information is done by scoring from 1 to 5 (reliability score) based on 5 questions (adapted from the DISCERN tool to

TABLE 1: Reliability, quality and comprehensiveness assessment and JAMAS tools of internet videos for testicular cancer self-examination.

Reliability
1. Are the aims clear and achieved?
2. Are reliable sources of information used? (i.e., publication cited)
3. Is the information presented balanced and unbiased?
4. Are additional sources of information listed for patient reference?
5. Are areas of uncertainty mentioned?
Global quality scale
1. Poor quality, poor flow of the video, most information missing, not at all useful for patients
2. Generally poor quality and poor flow, some information listed but many important topics missing, of very limited use to patients
3. Moderate quality, suboptimal flow, some important information is adequately discussed but others poorly discussed, somewhat useful for patients
4. Good quality and generally good flow. Most of the relevant information is listed, but some topics are not covered, useful for patients
5. Excellent quality and flow, very useful for patients
Comprehensiveness
1. Has the optimal time for testicular self-examination been specified?
2. Has it mentioned that the clothes needed to be taken off?
3. Has it been stated that examination should be done by standing in front of the mirror?
4. Has it been properly stated that how testicular self-examination should be done by hand?
5. Has it been mentioned which findings should be defined as alert findings?
6. Has it been mentioned the risk factors for testicular cancer?
The Journal of American Medical Association (JAMA) benchmark criteria
1. Authorship: Authors and contributors, their affiliations, and relevant credentials should be provided.
2. Attribution: References and sources for all content should be listed clearly, and all relevant copyright information noted.
3. Disclosure: Web site 'ownership' should be prominently and fully disclosed, as should any sponsorship, advertising, underwriting, commercial funding arrangements or support, or potential conflicts of interest.
4. Currency: Dates that content was posted and updated should be indicated.

evaluate written health information), Assessment of reliability of useful videos on testicular self-examination) (Table 1).[9,10]

Reliability of the source, accuracy of information and the benefit of video were assessed with JAMAS criteria (Table 1). Informative value of the educational videos was assessed with Global Quality Score (GQS).

Video Power Index (VPI) was used to assess view/like ratio for all the videos.[11,13]

STATISTICAL EVALUATION

NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) was used for statistical analysis. Normal distributions of quantitative data were tested by Shapiro-Wilk test. Kruskal-Wallis test and Dunn-Bonferroni test were used for comparisons of quantitative variables that were not in normal distribution between more than two groups. Spearman correlation analysis was used to evaluate the relationships between quantitative variables. Statistical significance was determined as $p<0.05$.

RESULTS

Total of 68 videos were included and 32 of videos were excluded due to being unrelated or repeated. English was the most common language with 86.8% (n=43) in the videos. The Kappa value among the observers was 0.93. One video (1.5%) has only musical content without any vocal description and 11.8% (n=8) of the videos were inaudible. The distribution of the videos according to their sources was determined that the source of 36.8% (n=25) was health information websites/TV programs, 23.5% (n=16) were independent users, 39.7% (n=27) were university channels/medical professionals.

The countries of the videos were as follows: 55.9% (n=38) from the USA, 10.3% (n=7) from Eng-

land, 1.5% (n=1) from Australia, 1.5% (n=1) from Indonesia, 1.5% (n=1) from Philippines, 1.5% (n=1) from South Africa, 1.5% (n=1) from Scotland, 1.5% (n=1) from Canada, 1.5% (n=1) from Egypt, 1.5% (n=1) from Nigeria, 1.5% (n=1) from New Zealand and there was no country specified in 20.6% (n=14) of the videos.

The videos were accessible for 20 to 4348 days; the mean value is 1381.78±1212.88 days. The median value was found to be 1057 days. The duration of the videos varies between 10 and 463 seconds, with a mean of 142.51±85.22 seconds. The median value was found to be 120 seconds. The number of views of the videos varies between 29 and 18345822, and the mean value is 421833.90±2242713.61. The median value was found to be 5685.5. The number of likes of the videos varies between 0 and 3300 and the mean is 335.14± 715.10. The median value was found to be 16. The amount of dislikes ranged from 0 to 536, with a mean of 48.35±102.14. The median value was found to be 1 (Table 2).

VPI values of the videos ranged from 0 to 403608084 and the mean value was detected to be 8821574.85±50873460.63. The median value was found to be 518.67. DISCERN scores of the videos ranged from 0 to 5, and the mean score was detected to be 2.97±1.13. The median value was found to be 3. The JAMAS scores of the videos ranged from 1 to 5, with a mean of 3.00±1.17. The median value was found to be 3.5. The GQS scores of the videos ranged from 0 to 5, with a mean score of 3.44±1.36. The median value was found to be 4. The TSE-C scores of the videos ranged from 0 to 6, with a mean of 4.34±1.65. The median score was found to be 5.

When VPI values were examined according to the video source, there was no statistically significant difference (p>0.05). According to the video source, there was a statistically significant difference in terms of DISCERN scores (p=0.049). As a result of Dunn-Bonferroni post-hoc tests, it was determined that the DISCERN scores of the videos whose source is university channels/medical professionals are higher than the DISCERN scores of the videos whose source is independent users (p=0.042). There was no statistically significant difference between other sources (p>0.05). There was a statistically significant difference in terms of JAMAS scores (p=0.009). As a result of the Dunn-Bonferroni post-hoc tests, it was found that the scores of the videos whose source is university channels/medical professionals are higher than the scores of the independent users (p=0.008). There was no statistically significant difference between other sources (p>0.05). There was no statistically significant difference in terms of GQS scores (p>0.05). When TSE-C scores were evaluated according to the video source, a statistically significant difference was found (p=0.019). As a result of the post-hoc tests of Dunn-Bonferroni, it was determined that the scores of videos whose source is university channels/medical professionals are higher than those of independent users (p=0.019). There was no statistically significant difference between other sources (p>0.05) (Table 3).

TABLE 2: Video characteristics.

		n	%
Video Source	Health information websites/ TV programs	25	36.8
	Independent users	16	23.5
	University channels/medical professionals	27	39.7
Language	English	59	86.8
	Music	1	1.5
	Mute	8	11.8
Country	USA	38	55.9
	Australia	1	1.5
	Indonesia	1	1.5
	Philipinnes	1	1.5
	South Africa	1	1.5
	England	7	10.3
	Scotland	1	1.5
	Canada	1	1.5
	Egypt	1	1.5
	Nigeria	1	1.5
	New Zeland	1	1.5
	Unknown	14	20.6
	Min-Max	**Mean±Standart Deviation (Median)**	
Duration (Day)	20-4348	1381.78±1212.88 (1057)	
Duration (Seconds)	10-463	142.51±85.22 (120)	
Views	29-18345822	421833.9±2242713.61 (5685.5)	
Like	0-3300	335.14±715.1 (16)	
Dislike	0-536	48.35±102.14 (1)	

TABLE 3: Comparison of scores by descriptive features.

	VPI	DISCERN	JAMAS	GQS	TSE-C
Video source					
Health information websites/TV programs	55807.29 (188.1, 1165352.88)	3 (2, 4)	4 (2, 4)	4 (3, 4)	5 (3, 5)
Independent users	1131.55 (0,1137290.5)	2 (2, 3)	2 (2, 2.5)	3 (2, 4.5)	4 (2.5, 5)
University channels/medical professionals	77.44 (2.52, 1114.05)	4 (2, 4)	4 (3, 4)	4 (2, 5)	5 (5, 6)
p	0.106	0.049*	0.009**	0.253	0.019*

VPI: Video Power Index; DISCERN: DISCERN questionnaire score; JAMAS: Journal of the American Medical Association benchmark criteria; GQS: Global Quality Scores; TSE-C: TSE-Comprehensiveness.
Kruskal-Wallis test, reported as median (first quartile, third quartile)
*p<0.05 **p<0.01

TABLE 4: Relationship between quantitative variables and scores.

		VPI	DISCERN	JAMAS	GQS	TSE-C
Time on air	r	0.474	-0.048	-0.016	-0.108	-0.103
	p	<0.001***	0.696	0.900	0.383	0.404
Duration	r	0.223	0.435	0.154	0.342	0.424
	p	0.074	<0.001***	0.209	0.004**	<0.001***
Views	r	0.966	0.121	0.064	0.051	-0.107
	p	<0.001***	0.325	0.604	0.681	0.387
Like	r	0.985	0.228	0.139	0.173	-0.027
	p	<0.001***	0.067	0.270	0.168	0.833
Dislike	r	0.913	0.094	0.017	0.036	-0.151
	p	<0.001***	0.457	0.892	0.778	0.229

VPI: Video Power Index; DISCERN: DISCERN questionnaire score; JAMAS: Journal of the American Medical Association benchmark criteria; GQS: Global Quality Scores; TSE-C: TSE-Comprehensiveness.
r: Spearman's rho **p<0.01 ***p<0.001.

There was a positive correlation between the duration of the videos and the VPI values at the level of 0.474 (r: 0.474, p<0.001). There was a positive correlation between the duration of the videos and DISCERN scores at the level of 0.435 (r: 0.435, p<0.001). There was a positive correlation between the duration of the videos and GQS scores at the level of 0.342 (r: 0.342, p=0.004). There was a positive correlation between the duration of videos and TSE-C scores at the 0.424 level (r: 0.424, p<0.001). No statistically significant relationship was revealed between the number of views of videos and DISCERN, JAMAS, GQS and TSE-C scores (p>0.05). There was no statistically significant relationship between the likes of videos and DISCERN, JAMAS, GQS and TSE-C scores (p>0.05). A positive correlation was revealed between the dislikes of the videos and the VPI values at the level of 0.913 (r: 0.913, p<0.001) (Table 4).

There was no statistically significant relationship between the VPI values of the videos and DS, JAMAS, GQS and TSE-C scores (p> 0.05). There was a positive correlation between JAMAS scores of the videos and TSE-C scores at the level of 0.440 (r: 0.440, p <0.001). There was a positive correlation between GQS scores of the videos and TSE-C scores at the level of 0.765 (r: 0.765, p <0.001) (Table 5).

DISCUSSION

Our study showed that;

i) Videos from university channels/medical professionals, the most common video source, had the highest average DISCERN, JAMAS, GQS and TSE-C scores.

ii) Evaluations other than JAMAS were lower than the upper limit,

iii) Among the university channels/medical professionals and health information websites/TV programs, evaluations other than DISCERN scored similar,

TABLE 5: Relationship between scoring systems.

		VPI	DISCERN	JAMAS	GQS	TSE-C
VPI	r	1.000				
	p	-				
DISCERN	r	0.201	1.000			
	p	0.109	-			
JAMAS	r	0.119	0.682	1.000		
	p	0.343	<0.001***	-		
GQS	r	0.151	0.851	0.632	1.000	
	p	0.231	<0.001***	<0.001***	-	
TSE-C	r	-0.048	0.751	0.440	0.765	1.000
	p	0.704	<0.001***	<0.001***	<0.001***	-

VPI: Video Power Index; DISCERN: DISCERN questionnaire score; JAMAS: Journal of the American Medical Association benchmark criteria; GQS: Global Quality Scores; TSE-C: TSE-Comprehensiveness.
r: Spearman's rho ***p<0.001.

iiii) The videos posted by independent users are completely misleading and these videos had higher VPI than university channels/medical professionals videos, which showed that video watchers did not consider the source.

Two main factors play a role in the hypothesis of the study. First, the increase in the number of outpatient clinic applications after some online research. The second is the increasing number of patients using the internet for medical professions and various reasons, especially during this pandemic.

Our study pointed 5 important topics were out. i) YouTube contains information about TSE which health consumers are displaying, ii) video contents should be accurate due to the rely of users on YouTube, iii) YouTube is not an adequate source of info because it frequently includes contradictory data despite reference standards/instructions, iv) rarity of relevant videos, which could be evaluated, shows that health consumers searching for TSE videos are exposed to irrelevant sources, v) YouTube might have an educational potential for TSE, if it filters useful and relevant videos and develops a method in this manner.

It is an important result that there is no relationship between the number of views, the number of likes and the quality. In the present study, similar results were revealed with the reliability, utility and quality of the information used in other healthcare and informational videos on YouTube.[16,17] One of good example of this is a recent article reports that although there are many YouTube videos in English about breast self-examination, most of them contain misleading information.[18]

Testicular cancer (TCa) accounts for 1% of male neoplasms and 5% of urological tumors, with 3-10 new cases per 100,000 men per year in the western population.[15] In the study of Kennett et al., the majority of men (75.8%) were reported to have heard of TCa, and the results were found to be similar to studies in different populations.[19-22] In the same study of Kenett et al, the rate of men who stated that they heard TSE more than TC was 79.9% and who stated that they taught TSE was 41%.[19] But different research evidence shows very small number of men are practicing it and have intention to practice it.[23-26]

In most testicular cancer cases, the discovery of the cancer is accidental by patients or their partners. According to United States Preventive Services Task Force (USPSTF), testicular self-examination is a controversial issue. In 2011, the USPSTF presented a "D" rating to the TSE in its final recommendation for TCa screening, providing a "moderate degree of certainty associated with no clear benefit of TCa screening." This recommendation applies to asymptomatic men. The USPSTF excluded men with a history of cryptorchidism.[27]

The American Academy of Family Physicians recommends against routine screening for testicular cancer in men.[28] Similar studies revealed that TSE can increase the awareness in the target group for

TCa and TSE may be cost effective with letting early diagnosis.[29-31] There are some studies that support TSE as the preferred method because it can be easily applied in TCa screening and reduce the costs of its treatment.[31,32] Rovito et al. strongly recommends the testicular self-examination as a lifelong habit for early detection of TCa.[30] TSE has been reported to be a useful screening method for the early detection of other testicular diseases beyond detecting cancer.[33]

An important limitation of our study was that we could not determine whether the change in the testicle that people noticed by chance because of watching TSE videos was to find out or to learn monthly screening. On the other hand, TSE is a controversial issue as a screening.

CONCLUSION

It is concluded that the information of TSE videos on YouTube is a weak source when evaluated in terms of reliability, benefit and quality.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Tuncay Taş;* ***Design:*** *Tuncay Taş; Ersan Arda;* ***Control/Supervision:*** *Taha Uçar, Basri Çakıroğlu;* ***Data Collection and/or Processing:*** *Tuncay Taş;* ***Analysis and/or Interpretation:*** *Tuncay Taş;* ***Literature Review:*** *Tuncay Taş, Ersan Arda;* ***Writing the Article:*** *Tuncay Taş;* ***Critical Review:*** *Taha Uçar, Ersan Arda, Basri Çakıroğlu;* ***References and Fundings:*** *Tuncay Taş;* ***Materials:*** *Tuncay Taş.*

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