ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

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Evaluation of Quality and Reliability of YouTube Videos on Idiopathic Adolescent Scoliosis

YouTube Videolarının İdiyopatik Adölesan Skolyoz Hakkında Kalite ve Güvenilirliğinin Değerlendirilmesi

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ABSTRACT Objective: Awareness of families about idiopathic adolescent scoliosis is extremely important for early diagnosis and treatment. As with other health issues, social media has an important place in raising public awareness about scoliosis. For this purpose, we aimed to investigate the quality and reliability of the videos on idiopathic adolescent scoliosis on the YouTube video portal. **Material and Methods:** The descriptive study included 50 English videos obtained by searching the keyword "adolescent scoliosis" on YouTube on October 9, 2021. The content of the videos, the accuracy and reliability of the information they conveyed to the society were examined. DISCERN score was used to determine the reliability of the videos. The instructional properties of the videos were evaluated with the Global Quality Scale, which identified 3 quality groups as bad, medium, and high quality videos. **Results:** When videos were classified by quality, more than half were identified as high quality. Among high-quality videos, videos shared by physicians had the highest rate (92%). There was no difference between the video source groups in terms of video duration, number of views, number of likes and dislikes (p=0.17; p=0.79; p=0.54; p=0.76). The DISCERN score for physicians was significantly higher among video source groups (p<0.001). **Conclusion:** Although the reliability of the videos uploaded by the physicians was higher, the viewing rates were lower. This shows us that we need to provide more accurate information sources according to the needs of the society.

Keywords: Idiopathic adolescent soliosis; social media; spine

ÖZET Amaç: Ailelerin idiyopatik adölesan skolyoz hakkında bilinçlenmesi, erken tanı ve tedavi için son derece önemlidir. Diğer sağlık konularında olduğu gibi sosyal medya; skolyoz konusunda da toplumu bilinçlendirmede önemli bir yere sahiptir. Bu amaçla, YouTube video portalında yer alan idiyopatik adölesan skolyozu ile ilgili videoların kalitesini ve güvenilirliğini araştırmayı amaçladık. **Gereç ve Yöntemler:** Tanımlayıcı tipteki çalışmaya 9 Ekim 2021 tarihinde YouTube'da "adölesan idiyopatik skolyoz" anahtar kelimesi ile arama yapılarak elde edilen 50 adet İngilizce video dâhil edilmiştir. Videoların içerikleri, topluma aktardıkları bilgilerin doğruluğu ve güvenilirliği incelenmiştir. Videoların güvenilirliğini belirlemek için DISCERN puanı kullanılmıştır. Videoların öğretici özellikleri, kötü, orta ve yüksek kaliteli videolar olarak 3 kalite grubunu belirleyen Küresel Kalite Ölçeği ile değerlendirildi. **Bulgular:** Videolar kalitesine göre sınıflandırıldığında, yarısından fazlası yüksek kaliteli olarak tanımlandı. Kaliteli videolar arasında en yüksek orana (%92) hekimler tarafından paylaşılan videolar sahip oldu. Video süresi, izlenme sayısı, beğeni ve beğenmeme sayıları açısından video kaynak grupları arasında fark yoktu (p=0,17; p=0,79; p=0,54; p=0,76). Hekimler için DISCERN skoru, video kaynağı grupları arasında anlamlı olarak yüksekti (p<0,001). **Sonuç:** Hekimlerin yüklediği videoların güvenilirliği daha yüksek olmasına rağmen izlenme oranları daha düşüktü. Bu da bize toplumun ihtiyaçlarına göre daha doğru bilgi kaynakları sağlamamız gerektiğini gösteriyor.

Anahtar Kelimeler: İdiyopatik adölesan skolyoz; sosyal medya; omurga

Internet has become an important source of information in parallel with the increase in its use in society. Obtaining health information online has become more and more popular, and people often use the internet as a source of health information.[1] One study reported that almost half of adults use the internet as a tool to obtain health-related information.

Youtube (Google Inc., CA, USA) is a popular video sharing site widely used around the world that allows users to share and watch videos. YouTube

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should be recognized as an effective tool for the acquisition and dissemination of health-related information due to its vast and free video content.[2] YouTube can be a tool for educating patients or a source of information about patients' health issues. But there are concerns about the quality, and content of videos on this platform. There are limited mechanisms to control the content, information quality and accuracy of shared videos. Therefore, there are doubts about the reliability of sources and the risk of giving misleading information. In a systematic review, YouTube was found to contain high-quality information as well as videos that disclose contradictory and misleading information.[3] The PubMed search engine returns about 2,100 results when the keyword "youtube" is queried (accessed October 9, 2021).

Scoliosis is defined as a deviation of the normal vertical line of the spine, which consists of a lateral curvature with the rotation of the vertebrae in curvature. Typically, at least 10° spinal angulation associated with vertebral rotation must be present on the posterior-anterior radiograph for scoliosis to be considered.[4] The causes of scoliosis can be very different, including congenital, neuromuscular diseases, syndrome-related and idiopathic. Idiopathic adolescent scoliosis is the most common type of scoliosis without underlying congenital or neuromuscular abnormalities, mostly occurring in children and adolescents. Conservative, physical therapy, brace, electrical stimulation can be applied in the treatment of scoliosis. Surgical treatment is applied for patients who do not benefit from conservative treatment and for advanced curvatures.[5]

Unlike videos on various medical topics, the quality of idiopathic adolescent scoliosis videos on YouTube has not been investigated. The purpose of this study is to evaluate the quality of the most watched English YouTube videos about idiopathic adolescent scoliosis.

MATERIAL AND METHODS

YOUTUBE SEARCH

This was a descriptive study. The keywords "adolescent scoliosis", "scoliosis assessment", "scoliosis exercise", "scoliosis treatment" were used for searching videos on YouTube (www.youtube.com) on October 9th, 2021. English language videos on the first three pages (60 videos in total) were assessed by two researchers experienced in scoliosis. Previous research indicates that most users only watch videos on the first three pages.[6] A total of 240 videos were evaluated by 2 researchers. Off-topic videos, duplicate videos, videos in a language other than English, and videos with inappropriate audio were excluded from the study. Following the exclusion criteria, 50 videos remained.

VIDEO CHARACTERISTICS

The video length, the date of upload, the number of views, likes, dislikes, the number of comments were recorded for each video. The total number of views, likes, dislikes, and comments were divided by the total number of days on YouTube. Thus, values per day were obtained view ratio (views/day), like ratio (like*100/like þ dislike). To evaluate the popularity of the videos using a different index called Video Power Index (VPI) calculated by the following formula: like ratioview ratio/100. Thus, assessment of the contents of the video through scoring systems and evaluation of the popularity of the videos were possible.[7]

SOURCES OF THE VIDEOS

The sources of the videos were divided into 8 categories: 1) Health professionals (trainer, nonphysician health personnel), 2) Physician, 3) Health-related-website, 4) Academic, university/professional organization/association, 5) Patient, independent user.

CONTENTS OF THE VIDEOS

Video content was classified into the following categories: 1) Exercise training (videos on rehabilitation and therapy), 2) General information related to scoliosis, 3) Patient testimonials, 4) Surgical management, 5) Non-surgical management (scoliosis brace treatment, lifestyle changes).

ASSESSMENT OF QUALITY

To assess the overall educational content quality of the videos, we used the Global Quality Score (GQS). The GQS is a ranking tool ranging from poor quality (not educationally useful to patients) to excellent quality and flow (highly useful to patients). Scores

TABLE 1: The Global Quality Score.

1	Poor quality; not useful for patient education
2	Poor quality; minimal relevant information. Limited utility to patients
3	Suboptimal quality; some useful information present, but missing key topics. Somewhat useful to patients
4	Good quality; most important topics discussed. Useful to patients
5	Excellent quality; all topics covered in a clear manner. Highly useful to patients

TABLE 2: DISCERN reliability tool.

1	Is the video clear, concise, and understandable?
2	Are valid sources cited? (from valid studies, physiatrists)
3	Is the information provided balanced and unbiased?
4	Are additional sources of information listed for patient reference?
5	Does the video address areas of controversy/uncertainty?

range from 1 to 5 with a maximum score of 5 indicating high educational quality.[8] The educational quality of YouTube videos was reviewed by 2 independent researchers (2 physicians who have been working as physiatrists for 10 years and have participated in many training and workshop programs about scoliosis) according to the GQS (Table 1).

ASSESSMENT OF RELIABILITY

The reliability of the YouTube videos was assessed using the DISCERN tool. This is a five-point assessment tool that was originally created by Charnock et al.[9] DISCERN includes 5 questions and each question is answered as yes or no. Each yes answer is evaluated as 1 point; the maximum score is 5 (Table 2).

ETHICS STATEMENT

This study did not include any human participants or animals. Publicly available videos were evaluated for this study. Therefore, ethics committee approval was not required. Similar studies in the literature followed the same path.[10]

STATISTICAL ANALYSIS

All statistical analyses were performed using SPSS for Windows version 25.0 (IBM SPSS, Armonk, NY: IBM Corp.) For the analysis of quantitative data, the conformity to the normal distribution was examined with the Kolmogorov-Smirnov test; parametric methods were used in the analysis of variables with normal distribution and homogeneous variances, and non-parametric methods were used in the analysis of variables with normal distribution and homogeneous variance. One-way ANOVA test was used to compare more than two independent groups. Chi-square test was used to compare categorical groups. Quantitative data were expressed in the tables as mean±standard deviation. Categorical data were presented as numbers (n) and percentages (%). Cohen's kappa coefficient was used to determine the inter-rater agreement of the two independent researchers. The data were analyzed at 95% confidence level, and a p value less than 0.05 was considered statistically significant.

RESULTS

A total of 50 videos were analyzed, and the baseline characteristics of these videos are summarized in Table 3. The sources of upload were identified as trainer, physicians, health-related websites, university/professional organization/association, nonphysician health personnel and patient, but it was discovered that there was no video uploaded by academic and independent user. Among the video uploaders, 50% of the videos were uploaded by physicians and nonphysician health personnel are the least uploaded (6%).

According to the GQS, there were 10 poor-quality, 9 moderate-quality, 31 high-quality videos. According to video quality, 62% of the videos were found to be high quality. While physicians had the highest ratio as the source of upload in the high-quality group (92%) the health-related website was the group with the highest rate of low-quality video up-

TABLE 3: Video characteristics.

Characteristic	$\bar{X}$±SD	Minimum-maximum
Video duration (min)	451.42±335.08	54-1802
Number of views	176757.20±367002.56	334-1649542
Days since upload	1316.56±900.52	176-3785
View ratio (views/d)	126.65±194.88	0.72-742.34
Number of likes	1562.80±2632.30	0-10000
Number of dislikes	43.04±92.49	0-535
Number of comments	160.52±422.82	0-2705
Like ratio	87.47±29.34	0-100
Video power index	108.78±187.02	0-731.80

SD: Standard deviation.

loads, and there were no high-quality videos in this group. The quality between sources of the videos was significant (p<0.01) (Table 4). According to contents of the videos, the most groups were related to general information related to scoliosis (42%, n=21). Among the high-quality videos, the videos related to surgical management, general knowledge, exercise and as video topics were significantly higher.

There was no difference between video source groups for video duration, number of views, number of likes, number of dislikes (p=0.17; p=0.79; p=0.54; p=0.76). Among video source groups, the DISCERN score was very significantly higher for physicians (p<0.001) (Table 5).

Then the DISCERN scores, view ratio, and VPI were significantly different in the 3 quality groups (p<0.001, p=0.030, and p=0.038, respectively). It was discovered that as the quality increased, video duration, the view ratio, and VPI of the videos also increased, as well as the DISCERN scores. However, the like ratio among the quality groups remained similar (p=0.34, p=0.056, respectively) (Table 6). Finally, κ was calculated as 80% for the inter-rater reliability.

TABLE 4: Sources of the videos and contents of the videos between Global Quality Score.

	Low quality (%)	Intermediate quality n (%)	High quality n (%)	Total (n)	p value
Sources of the videos					
Health professionals (trainer, nonphysician health personnel)	1 (12.5)	3 (37.5)	4 (50)	8	<0.001
Physician	1 (4)	1 (4)	23 (92)	25	
Health-related website	5 (83.3)	1 (16.6)	0 (0)	6	
Academic, university/professional organization/association	1 (14.2)	3 (42.8)	3 (42.8)	7	
Patient, independent user	2 (50)	1 (25)	1 (25)	4	
Contents of the videos					
Exercise training (videos on rehabilitation and therapy)	1 (6.6)	4 (26.6)	10 (66.6)	15	0.04*
General information related to scoliosis	5 (23.8)	2 (9.5)	14 (66.6)	21	
Patient testimonials	4 (50)	2 (25)	2 (25)	8	
Surgical management	0 (0)	0 (0)	5 (100)	5	
Non-surgical management (scoliosis brace treatment, lifestyle changes)	0 (0)	1 (100)	0 (0)	1	

*p<0.05.

TABLE 5: The parameters of videos according to source groups.

Source group (n)	Video duration (sec)	Number of views (X̄±SD)	Number of likes (X̄±SD)	Number of dislikes (X̄±SD)	DISCERN score (X̄±SD)
Health professionals (trainer, nonphysician health personnel) (8)	613.20±296.97	172114.40±172001.73	2766±2725.15	60±57.93	2.20±0.45
Physician (25)	535.36±376.74	223334.76±455940.35	1720.24±2812.45	45.76±110.94	3.76±1.05
Health-related website (6)	218.83±87.19	21260.83±17970.59	188±164.78	6.33±5.28	1.33±1.03
Academic, university/professional organization/association (7)	365.43±360.42	221447.43±394735.97	1874.86±3618.06	57.14±98.24	3±1.15
Patient, independent user (4)	241.25±22.91	8999.50±8495.19	157.50±171.62	2.50±2.08	1.50±1.73
p value	0.17	0.79	0.54	0.76	<0.001*

*p value<0.05; SD: Standard deviation.

TABLE 6: The parameters of videos according to quality groups.

	Low quality (n=10)	Intermediate quality (n=9)	High quality (n=31)	p value
DISCERN	1.20±0.92	2.33±0.71	3.77±1.02	<0.001*
Like ratio	96.46±3.02	76.59±42.54	87.73±29.30	0.340
View ratio	17.89±18.80	56.16±51.59	181.19±229.33	0.030*
VPI	17.41±18.31	30.52±25.45	160.98±222.29	0.038*
Video duration (min)	244.90±137.68	409.11±311.04	530.32±361.55	0.046*

*p value<0.05; VPI: Video power index.

DISCUSSION

Social media has an important role in obtaining health-related information. Especially nowadays, YouTube has become a popular and open access social media platform. YouTube contains informative, educational and instructive videos about diseases and medical conditions.[11] However, there are too many videos that contain false and insufficient information.[12] On the other hand, idiopathic adolescent scoliosis is a serious health problem in childhood and adolescence. Early diagnosis and treatment are important for scoliosis progression. Families should be informed correctly about idiopathic adolescent scoliosis.[13] For this reason, videos about scoliosis should be of high quality in childhood and adolescent musculoskeletal health.

When we examined the literature, we found very few studies on social media videos related to scoliosis.[14,15] In this study, videos about scoliosis on YouTube were evaluated in terms of quality and it was seen that more than half of the videos were of high quality. When the videos were analyzed according to uploaders it was also found that physicians uploaded the highest quality videos, and the lowest quality health-related websites. Similarly, studies have found that the ones with the highest video quality are the videos uploaded by physicians, and academics.[16] Similar results with our study were obtained in the studies in which the videos uploaded about musculoskeletal diseases were examined in the literature.

YouTube is a platform that offers the chance to view, like, dislike and freely by the viewers. Studies show differences in the relationship between the quality and reliability of the videos and like ratio and view ratio. Singh et al. found that there was no relationship between the reliability and quality of the video and like ratio, dislike ratio, and view ratio.[17] In a video study about scoliosis by Staunton et al., lower quality videos had higher view ratio than higher quality ones. The authors attributed this to the more difficult it is to present high-quality information and the lower the rating.[14] In our study, the rate ratio of high-quality videos was higher than low-quality videos. However low-quality videos had more like ratio than other groups. In our study, it may seem like a contradiction that high-quality videos have a high number and view ratio, but a low likes ratio. It is pleasing that viewers can access high-quality videos about scoliosis. However, the likes ratio may decrease because the video duration of high-quality videos is longer.

In the study by Yörükoğlu and Uzun on osteoporosis, it was found that the view ratio of the videos uploaded by the websites was higher. They stated that visual effect and animation shows are more effective on people and the view ratio is higher.[18] In our study, the view ratio of the videos uploaded by the physicians was high, while the likes ratio of the videos was low, which is a chance for the patients to reach reliable videos. However, the fact that the videos uploaded by physicians are longer and contain medical terminology may decrease the likes ratio. In this respect, there is a need for reliable videos with short-term and understandable terminology, which are uploaded by physicians.

The duration of a video is important in terms of making the video more comprehensive in terms of content. There have been studies reporting no correlation between video duration and quality. In the study by Akyol and Karahan on sarcopenia, the longer the video duration, the higher the quality of the video. Similarly, in our study, the video duration was found to be longer in high-quality videos.[19]

Although there is no previous study evaluating the relationship between video content and video quality, we evaluated it in this study. In our study, all of the videos about surgical treatment were of high quality. This may be because videos about scoliosis surgery are only uploaded by physicians and are a specific area that requires more expertise than other video content. In our study, other video contents with high video quality were general information and exercise videos about scoliosis. The popularity of videos is measured by VPI. Among the video qualities, the group with the highest popularity was high-quality videos.

As a result, thousands of health-related informational videos are uploaded to YouTube every day. Especially videos uploaded by physicians are high quality videos. However, the quality of the video is independent of variables such as likes, dislikes, and the number of comments.[20]

CONCLUSION

We think that our study is an important study evaluating the reliability and quality of videos about idiopathic adolescent scoliosis. We hope that it will contribute to the literature due to the more frequent use of the internet as a source of health-related information and the scarcity of studies in this field, especially during the pandemic period. Although the videos uploaded by physicians are the best quality videos, it is pleasing in terms of health-related videos that the rate of viewing and popularity is higher. However, the long video duration of quality videos reduces the rate of likes. There is a need for reliable videos with short-term and understandable terminology uploaded by physicians in order to increase the appreciation of the audience and to reach the right information.

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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: *Hatice Ağır, Mustafa Tuna;* ***Design:*** *Hatice Ağır;* ***Control/Supervision:*** *Hatice Ağır, Mustafa Tuna;* ***Data Collection and/or Processing:*** *Hatice Ağır, Mustafa Tuna;* ***Analysis and/or Interpretation:*** *Hatice Ağır, Mustafa Tuna;* ***Literature Review:*** *Hatice Ağır;* ***Writing the Article:*** *Hatice Ağır;* ***Critical Review:*** *Hatice Ağır;* ***Materials:*** *Hatice Ağır.*

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