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Popularity, quality and reliability of YouTube videos as an information resource on kinesio taping

Orhan Güvener[1], **Figen Dağ**[1], **Pınar Müge Sarıkaya**[2]

1 Mersin University Medical School, Department of Physical and Rehabilitation Medicine, Mersin, Turkey

2 Mersin City Training and Research Hospital, Department of Physical and Rehabilitation Medicine, Mersin, Turkey

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Abstract

Objective: This study aimed to evaluate the reliability and quality of videos on YouTube as an information resource about Kinesio taping (KT).

Methods: We made a search on YouTube using the keyword "Kinesiotaping" on November 10, 2021. The popularity of first 200 videos evaluated with the video power Index (VPI), reliability with the modified DISCERN (M-DISCERN) score, and quality with the global quality score (GQS).

Results: Of the 98 videos evaluated, 42(42.9%) were categorized as high-quality, 36(36.7%) as low-quality, and 20(20.4%) as moderate-quality. Significant positive correlations were observed between GQS, M-DISCERN, and VPI ($p<0.001$, for all). Number of views, number of views/days, number of likes, number of dislikes, duration of videos, and number of comments were significantly lower in low quality videos than those of moderate and high-quality videos($p<0.05$).

Conclusion: The quality of YouTube videos as an information source on KT were of moderate level. As the quality and reliability of the videos increase, their popularity also increases. Health professionals who use YouTube as informational material in KT applications should consider this situation.

Keywords: Kinesio taping, online education, quality, reliability, YouTube

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Correspondence / Yazışma Adresi: *Orhan Güvener, Mersin University Medical School Department of Physical and Rehabilitation Medicine33343, Mersin, Turkey e-mail: dr.orhanguvener@gmail.com*

Kinesio bantlama konusunda bir bilgi kaynağı olarak YouTube videolarının popülerliği, kalitesi ve güvenilirliği

Öz

Amaç: Bu çalışma, Kinezyo bantlama (KT) ile ilgili bir bilgi kaynağı olarak YouTube'daki videoların güvenilirliğini ve kalitesini değerlendirmeyi amaçlamıştır.

Yöntemler: 10 Kasım 2021' de "Kinezyo bantlama" anahtar sözcüğünü kullanarak YouTube' da bir arama yapıldı. İlk 200 videonun popülerliği video gücü İndeksi (VPI), güvenilirliği modifiye DISCERN (M-DISCERN) puanı ve kalitesi global kalite puanı (GQS) ile değerlendirildi.

Bulgular: Değerlendirilen 98 videodan 42'si (%42,9) yüksek kaliteli, 36'sı (%36,7) düşük kaliteli ve 20'si (%20,4) orta kaliteli olarak kategorize edildi. GQS, M-DISCERN ve VPI arasında anlamlı pozitif korelasyonlar gözlendi (tümü için p<0,001). Düşük kaliteli videolarda izlenme sayısı, izlenme/gün sayısı, beğeni sayısı, beğenmeme sayısı, video süresi ve yorum sayısı orta ve yüksek kaliteli videolardan önemli ölçüde daha düşüktü(p<0.05).

Sonuç: KT ile ilgili bir bilgi kaynağı olarak YouTube videolarının kalitesi orta düzeydeydi. Videoların kalitesi ve güvenilirliği arttıkça popülerlikleri de artıyordu. YouTube'ukinesio bantlama uygulamalarında bilgi kaynağı olarak kullanan sağlık profesyonelleri bu durumu göz önünde bulundurmalıdırlar.

Anahtar kelimeler: Kinezyo bantlama, online eğitim, kalite, güvenirlik, YouTube.

INTRODUCTION

Kinesio taping (KT) is a widely used method in physical medicine and rehabilitation. KT was developed by Dr. KenzoKase to provide support to the musculoskeletal system and is applied with a light, elastic, and acrylic adhesive commercial tape[1]. The purposes of the taping method applied on stretched structures are to increase the interstitial lymphatic space by lifting the skin and the structures underneath, to facilitate venous and lymphatic fluid flow, and thus to support tissue regeneration[2]. KT has a wide range of musculoskeletal indications[2–5] and it's a fast, easy-to-apply, and cost-effective method [6]. It can also be used in various medical fields, such as orthopedics and traumatology, neurology, rheumatology, oncology, gynecology and obstetrics, and pediatrics[7].Books have been written, educational courses[8,9] have been offered, and workshops and congresses have been organized in many countries for KT applications. Mostly, physiotherapists, orthopedists, sports physicians, and physiatrists with anatomy, physiology, kinesiology education are targeted in these endeavors. E-learning has become an optional and supplementary method to well-known KT education due to the novel coronavirus pandemic[10].

The internet and social media have increasingly been key sources of information about health[11].YouTube, a video sharing site where users can interact and socialize, is one of the most popular websites in this regard, with an average of a new video uploaded every minute, an average of 2 billion views per day, and on YouTube each user spends at least[15] minutes a day[12]. Medical students and doctors have been increasingly using the YouTube to reach medical contents[13], and similarly patients have been increasingly using the internet as a health information source[12]. Since the videos published on this social platform can be produced and shared by anyone without having any qualification in a particular field, these videos are of different quality and reliability. For this reason, the dissemination and accessibility of unreliable and poor-quality information may create difficulties in providing health care[14].

YouTube videos' quality and reliability have been evaluated for many medical fields and perspectives[14] such as gynecology and obstetrics[15], rheumatology [16], orthopedics and traumatology[17], neurosurgery[11], nephrology[18], gastroenterology [19] and dermatology[20]. Similar to other branches, the use of YouTube as a source of education and information in the field of physical medicine and rehabilitation has been increasing recently. In the literature, there are studies evaluating the quality, popularity, and safety of YouTube videos as a source of information and education on subjects such as exercise training[21], lymphedema rehabilitation[22], fibromyalgia[23], and musculoskeletal ultrasound[14]. However, to the best of our knowledge, there has been no assessment of quality and reliability of KT-related internet video material. Therefore, we aimed to assess YouTube videos' quality and reliability as an alternative information resource on KT. We consider that the results of our study will provide information to the literature.

METHOD

Search Protocol

This study is a cross-sectional study. A search was performed on YouTube website on November 10, 2021 with the keyword "kinesio taping" using the default "relevance mode" on YouTube. We reached the YouTube website using the incognito mode of Google Chrome so that the previous search history does not affect new search results. Similar to previous studies, first 200 videos were included in our research[14].

In this study, similar other YouTube studies 11 no application for ethical approval was made, since only the public videos available on YouTube were examined and no volunteers were included in the study.

Exclusion criteria and data collection

Only videos in English were evaluated, and videos that were not associated with KT, duplicate videos, videos with music, and videos without sound were excluded, similar to previous studies[11,14]. Two hundred YouTube videos were watched and examined. Sixty-eight videos in a non-English language, 11 videos with music throughout the video, nine videos without sound, seven irrelevant videos about animal practices, five commercial videos, and two videos longer than 1 hour were excluded from the study (Figure 1). Out of a total of 200 videos, 98 videos meeting the study criteria were analyzed by a KT certified physical therapist and a physiatrist. Video characteristics such as title, upload date, numbers of views, likes/dislikes, and comments were noted for evaluation. After the videos were analyzed by two independent authors, the video score was calculated by averaging the scores given by the authors.

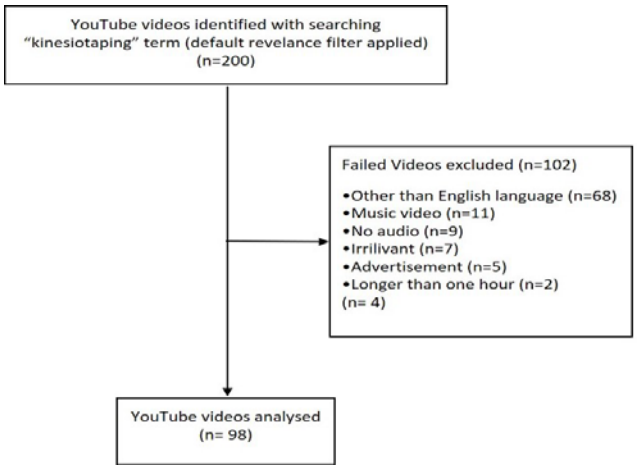

Figure 1: Flowchart of identified YouTube videos about Kinesiotaping

The popularity of the YouTube videos

Video Power Index (VPI) developed by Erdem using the "number of likes x 100 / (number of likes + number of dislikes) x (number of view/day) / 100" formula was used to evaluate the popularity of the video[24].

Evaluation of the quality and reliability of the YouTube videos

The reliability was evaluated with with a 5-item questionnaire called modified DISCERN (M-

DISCERN) questionnaire (Table 1)[25]. This questionnaire uses a 5 point Likert scale to estimate 5 items. Scoring is done by giving "1" points for each "yes" item and "0" points for each "no" item. A total score ranging from 0 to 5 is obtained by summing the scores of the five items. Videos with a score above 3 points were considered to indicate high reliability, videos with a score of 3 were considered to indicate moderate reliability, and a score below 3 were considered to indicate poor reliability[25].

Table I: Modified DISCERN Tool

Modified DISCERN Tool	
Score	**Description**
1	Is the aim of the video clear and understandable?
2	Are reliable sources of information used? (i.e., publication cited, speaker is clinician)
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?

The quality of the videos was evaluated with Global Quality Scale (GQS) (Table 2). 19 This questionnaire uses a 5 point Likert scale to estimate 5 items. Scoring is done by giving "1" points for each "yes" item and "0" points for each "no" item. A total score ranging from 0 to 5 is obtained by summing the scores of the five items. In this 5-point scoring;

4-5 points: High quality

3 points: Moderate quality

1-2 points: Low quality[14].

Table II: Global Quality Scale

Global QualityScale	
Score	**Description**
1	Poor quality, poor flow of the site, 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 not covered, useful for patient
5	Excellent quality and excellent flow, very useful for patients

Statistical Analysis

Data were analyzed with using the SPSS Software (Ver. 21). All variables were tested for normality using the Shapiro-Wilk test. The variables were non-normally distributed. Continuous data were shown as median and min-max values. Descriptive data shown as frequency (n) and percentage (%). The Kruskal-Wallis test was used for the difference between independent groups. Correlation between the data analyzed with Spearman correlation coefficient. $P<0.05$ was accepted as statistical significance level.

RESULTS

Basic characteristics and contents of analyzed the YouTube videos

The video contents, application fields, and presenters of the analyzed YouTube videos are listed in Table 3.

Table III: Basic characteristics and content of the analyzed YouTube videos

Video Metric Median (Min-Max)	
Days on YouTube	**1662(146-4313)**
Number of views	**20530.5(20-6356284)**
Number of views/days	**17.09(0.03-2773.91)**
Number of likes	**140(1-220274)**
Number of dislikes	**6.5(0-1079)**
Number of comments	**2.5(0-711)**
Duration (minute)	**3.2(0.33-18.42)**
Popularity	
VPI	15.27(0.03-2572.62)
Reliability and Quality	
M-DISCERN	2(1-5)
GQS	3(1-5)
Video Content n/%	
An overview of Kinesio Taping	6/6.1
Application in Neurological	5/5.1
Application in Orthopedic	82/83.7
Application in Pediatric	1/1
Application in Obstetrics and Gynecology	2/2
Application in Lymphedema	2/2
Application Region n/%	
Neck	1/1.1
Back	3/3.2
Low Back	3/3.2
Chest	4/4.3
Abdomen	4/4.3
Shoulder	22/23.7
Elbow	10/10.8
Wrist	6/6.5
Hand and Fingers	5/5.4
Hip	3/3.2
Knee	19/20.4
Ankle	6/6.5
Foot and Fingers	6/6.5
Presenter n/%	
Physiotherapists	30/30.6
Chiropractors	13/13.3
Physicians	1/1
Trainers	5/5.1
Osteopaths	10/10.2
Occupational Therapist	1/1
Unknowns	38/38.8

VPI: Video Popularity Index, M-DISCERN: Modified DISCERN score.

Intraclass correlation scores of interobserver were 0.83 for the GQS score and 0.89 for the M-DISCERN score.

Comparison of the quality of the analyzed YouTube videos

The analyzed videos were categorized into 3 groups with regard to GQS: The scores 1-2 were classified as low-quality (36.7%), 3 as moderate-quality 20.4%, and 4-5 as high-quality (42.9%).

Comparison of the analyzed YouTube videos according to the stratification of Global Quality Score between groups is demonstrated in Table 4. The total days on YouTube was statistically significantly lower in low-quality videos than high-quality videos (p=0.007). The numbers of views, views/days, likes/ dislikes, and video durations were significantly lower in low-quality videos than those of the moderate-quality (p= 0.04, p=0.04, p=0.01, p=0.03, and p=0.002, respectively). In addition, all these parameters were significantly lower in low-quality videos than high-quality videos (for all parameters p<0.001). The median video duration was significantly lower in low-quality videos than those moderate-quality (p=0.02). Moreover, the highest number of comments was recorded for high-quality videos. VPI was significantly lower in low-quality videos than those high-quality (p<0.001). The highest M-DISCERN score was obtained from high quality-videos (Table 4).

Table IV: Comparison of the analyzed YouTube videos according to the stratification of Global Quality Score

	Low-Quality Median (Min-Max)	Moderate-Quality Median (Min-Max)	High-Quality Median (Min-Max)	p
Video Metrics				
Days on YouTube	1662(296-2347) [b]	1662(659-3114)	2613.5(146-4313)	**0.004***
Number of views	3319.5(20-292477) [a,b]	13663(474-753341)	127452(50-6356284)	**<0.001***
Number of views/days	2.96(0.03-428.5) [a,b]	58.25(9.48-453.94)	64.2(1.18-2773.91)	**<0.001***
Number of likes	16.5(1-9809) [a,b]	102(3-4892)	681.5(1-220274)	**<0.001***
Number of dislikes	1(0-507)[a,b]	4.5(0-367)	35.5(0-1079)	**<0.001***
Number of comments	0(0-298) [b]	3.5(0-612) [c]	28.5(0-711)	**<0.001***
Duration	0.51(0.33-7.48)[a,b]	2.33(0.4-18.42) [c]	4.20(1.04-10.25)	**<0.001***
Popularity				
VPI	1.99(1.06-226.23) [b]	12.03(0.26-410.16)	62.61(0.03-2572.62)	**<0.001***
Reliability and Quality				
M-DISCERN	1(1-2) [b]	1(1-3)	4(2-5)	**<0.001***

**Values of p<0.05 were accepted as significant and marked in bold. VPI: Video Popularity Index, M-DISCERN: Modified DISCERN score.*

a Shows the difference between low quality and moderate quality, b Shows the difference between low quality and high quality, c Shows the difference between moderate quality and high quality

Table V: Relationships between analyzed YouTube videos features

	Views	Likes	Dislikes	Comments	Duration
VPI	r_s=0.96 **p<0.001***	r_s= 0.93 **p<0.001***	r_s= 0.89 **p<0.001***	r_s= 0.79 **p<0.001***	r_s= 0.59 **p<0.001**
M-DISCERN	r_s= 0.88 **p<0.001***	r_s= 0.61 **p<0.001***	r_s= 0.57 **p<0.001***	r_s= 0.58 **p<0.001***	r_s= 0.64 **p<0.001**
GQS	r_s= 0.57 **p<0.001***	r_s= 0.94 **p<0.001***	r_s= 0.91 **p<0.001***	r_s= 0.53 **p<0.001***	r_s= 0.68 **p<0.001**

** Values of p<0.05 were accepted as significant and marked in bold. VPI: Video Popularity Index, M-DISCERN: Modified DISCERN score.*

DISCUSSION

In our study, when we evaluated the YouTube videos' quality and reliability as an information resource on KT, we found the median quality scores of videos as 3 and the percentage of high-quality videos as 42.9%. In addition, as the quality increased, the reliability level of the videos increased. To the best of our knowledge, the quality and reliability of KT-related YouTube video material has not been investigated. This is a new analysis of YouTube records of interest to various clinicians.

Among the videos we analyzed, the oldest KT video was uploaded on YouTube ten years ago, whereas the video added latest was uploaded a few months ago, as of writing. The majority of the KT videos were uploaded in 2017 and it seems that the production of new KT videos has been still going on in recent months. KT, which is mostly used in orthopedics and physical therapy and rehabilitation clinics, can be applied in various medical disciplines[7]. The majority of the videos were musculoskeletal applications, followed by general information about KT and a few videos for other medical disciplines. Although the majority of them were shoulder and knee applications, there were videos of KT application in many anatomical regions. Since shoulder joint complaints among upper extremity problems and knee joint complaints among lower extremity problems are frequently higher in daily outpatient clinic applications, video distribution pattern was not surprising. Most of videos were presented by physiotherapists. We consider that this is due to the differences between countries regarding the definitions of the professions. We determined that some KT practices were performed by gym trainers. Although non-serious side effects such as allergic skin reactions, ineffectiveness, and increased pain are observed 1, these treatment applications are performed after the diagnosis is confirmed by the clinician. Therefore, this situation may cause a delay in the diagnosis and treatment of patients, as well as the observation of these side effects. Although anatomy and physiology education are included in the education programs, these applications should be applied by health professionals.

The results of studies evaluated YouTube videos' quality and reliability as an educational material on medical topic are various. Similar to our study, Zengin et al. investigated YouTube videos' quality about musculoskeletal ultrasound, and reported that the median quality score was 3 (moderate-quality) and the percentage of high-quality videos was 39.5%[14]. Kanlıöz et al. also found that the median-quality score of the videos as 3 in their study which aimed to investigate the reliability and educational characteristics of YouTube videos on hernia surgery performed with the laparoscopic TEP method26. Morais et al. investigated the educational YouTube videos' quality for oral lichen planus, and they reported that only 3 (8.1%) videos were of excellent-

quality[20]. For YouTube videos' quality of as an informational and educational resource for hysterectomy, Lee et al. classified only 6% of the videos as excellent, while 43% classified as moderate and 51% as poor[15]. Of course, these differences in the studies could be caused by the differences in the video content, as well as the scale and "quality definition" used for video quality. For example, some studies have evaluated video quality with GQS, while others have used DISCERN, which we used to evaluate reliability for this purpose.

There have been several varying findings reported about the relationships between YouTube video characteristics and quality score. In accordance with our hypothesis, there were significant positive correlation between GQS, the M-DISCERN, and VPI in our study. So, our findings demonstrated that more reliable and more popular videos were high-quality videos. Similar to our results, Cesur Aydın et al. reported that VPI and GQS positively correlated with DISCERN for YouTube videos on artificial intelligence in dental radiology[27]. However, Zengin et al. also reported a positive significant relationship between GQS and the DISCERN scores but no relationship between GQS and VPI scores. Moreover, they concluded that even if the reliability of high-quality videos is also high, YouTube users may not always prefer high quality and reliable videos[11].

Duration of videos might be an important determinant for quality and reliability. There were significant relationships between quality, reliability, and the duration of the videos. Moreover, the duration of the videos in our study was significantly shorter in low-quality videos than those of the moderate and high-quality videos. Similar to our results, it has been reported in recent studies that useful videos had the highest DISCERN scores[14,16,18]. Zengin et al. and Rittberg et al. found a significant positive relationship between video duration and video quality scores[8]. It was indicated that longer video durations may have increased intelligibility[14]. However, Ovenden et al. and ReFaey et al. have not reported any correlation between quality scores and video durations[29,30]. So, we considered that the reason for these differences in the studies might be related with the efficient use of time depending on the video subject. In addition, long video duration may increase reliability and quality especially for videos containing an application.

Our study has some limitations. First, we only included English videos for analyzing. Second, we screened only the first two hundred videos. However, the new videos have been constantly uploaded on YouTube. Because YouTube is a dynamic video platform, this limitation is valid for all YouTube studies. Third, we used only a single keyword "kinesio taping" since it's an umbrella term, as previous studies[14,16,17].

The present study revealed that the screened YouTube videos about KT were moderate-quality and higher quality and reliable videos were more popular. In this study, we evaluated quality and reliability of the videos about KT, but to evaluate its usability as an educational material in health sciences, there is a need for randomized controlled studies comparing quality videos with face-to-face education.

Ethics Committee Approval: In this study, similar other YouTube studies 11 no application for ethical approval was made, since only the public videos available on YouTube were examined and no volunteers were included in the study.

Conflict of Interest: The authors declared no conflicts of interest.

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