

Reliability and Quality Analysis of Therapeutic Exercise Videos on Youtube for Low Back Pain

Ahmet Kivanç Menekşeoğlu¹, Tuğba Şahbaz²

¹Department of Physical Medicine and Rehabilitation, University of Health Sciences, Kanuni Sultan Süleyman Training and Research Hospital, İstanbul, Türkiye

²Department of Physical Medicine and Rehabilitation, Beykent University, İstanbul, Türkiye

ABSTRACT

Objective: Health-related internet use has recently increased in parallel with the Internet use. Accuracy of information about diseases on the Internet is important in terms of patient education and reduction of health expenditures. The aim of this descriptive study was to evaluate the content, reliability, and quality of exercise videos for low back pain (LBP) on YouTube.

Materials and Methods: In October 2022, YouTube was searched in English with the keywords "LBP exercise," "LBP rehabilitation," "LBP physical therapy," and "LBP physiotherapy." 173 videos meeting the inclusion criteria were included in the analysis. Video duration, number of views, number of likes and dislikes, upload date, number of comments, and subscribers were recorded. The reliability was assessed using the modified DISCERN, the quality was assessed using the Global Quality Scale.

Results: It was determined that the quality of the videos uploaded by clinicians was higher ($p < 0.001$), the videos uploaded recently were of higher quality ($p = 0.024$), and clinicians have recently started to upload more videos to the YouTube platform ($p = 0.021$). However, although the quality was lower, the video power index of the videos uploaded by non-medical users was found to be higher.

Conclusion: In this study, it was concluded that the quality of exercise videos on YouTube for patients with LBP has recently increased, clinicians have recently started to upload more videos, videos uploaded by clinicians, and recent videos are of higher quality. It is important to increase the number of quality videos about diseases on platforms such as YouTube.

Keywords: Exercise, low back pain, physical therapy, Youtube

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INTRODUCTION

Low back pain (LBP) is defined as pain in the anatomical region between the 12th rib and the iliac crest.^[1] The prevalence of LBP, which is the most common cause of disability worldwide, is 18.3%, and it is a health problem that affects approximately 540 million people globally at any time. LBP is more common in developed countries, in individuals between the ages of 40–69 and in women.^[2]

Studies have shown that the effect of LBP on total health expenditures in the USA is more than 620 billion dollars, and its effect on annual expenditures is 1.8 billion dollars.^[3] In a study investigating the role of LBP in doctor visits, it was determined that up to 2 times the population per year applied to a doctor

due to spinal problems, and most of this was from non-traumatic patients.^[4] Considering the large and costly burden that LBP creates in health systems, patient education, and exercise training are of great importance in reducing spinal problems.^[5,6] LBP is generally evaluated in 4 categories as visceral pain, specific spinal disease, radicular syndromes, and non-specific LBP, and it has been shown that approximately 90% of patients have non-specific LBP.^[5] In the management of non-specific LBP, it is recommended that patients continue their daily activities, patient education, exercise therapy, and, if necessary, drug therapy.^[7] Heterogeneous exercise programs (stretching, core strengthening, flexibility, mobilization, etc.) are offered to patients in the management of LBP, and these programs have been shown to be effective on pain and functionality.^[8]



Address for Correspondence: Ahmet Kivanç Menekşeoğlu, Department of Physical Medicine and Rehabilitation, University of Health Sciences, Kanuni Sultan Süleyman Training and Research Hospital, İstanbul, Türkiye
E-mail: kivancmenekseoglu@hotmail.com **ORCID ID:** 0000-0001-5126-3554

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Health-related internet use has been increasing recently, the Internet is frequently used by patients to inform about the disease and to search for treatment options.^[9] YouTube is one of the largest video sharing websites in the world. YouTube has a widespread user base with its easy access and use features. On the platform, which includes videos in the field of health, there are also videos on patient education in different chronic diseases,^[10,11] surgical interventions and invasive procedures, and exercises that can be applied in different musculoskeletal diseases.^[12]

Studies investigating the quality of therapeutic exercises in musculoskeletal diseases on the YouTube platform are few in number and as far as we know, there is no study investigating exercises in LBP. With the high quality of the videos on widely used platforms such as YouTube, it is expected that there will be a decrease in the health expenditures and pain of the patients and an increase in the quality of life. The main purpose of this study is to evaluate the quality and reliability of the most watched YouTube videos on LBP exercises.

MATERIALS and METHODS

To determine the videos included in this cross-sectional study, 4 keywords were selected and a search was made on YouTube (www.youtube.com) on October 23, 2022. Keywords were: "LBP exercise," "LBP rehabilitation," "LBP physical therapy," and "LBP physiotherapy." The first 100 videos in each keyword were included in the study. A total of 400 videos under 4 titles were evaluated by two physicians experienced in LBP exercises. The videos included in the study were evaluated separately by two researchers. The consistency of the results of the two investigators was evaluated with Cohen's kappa coefficient. Duplicate videos, unrelated videos, non-English videos, and videos with poor audio/video quality were excluded. Following the exclusion criteria, 173 videos were included the analysis. 109 videos were not included due to duplication, 108 videos were irrelevant to the subject, 6 of them were not in English, and 4 of them were not included due to poor audio and video quality.

For all videos, video duration, number of views, likes and dislikes number, upload date, comments, and the number of subscribers were recorded. The video resource was categorized under 4 headings (clinician, other healthcare professional, independent user, and patient association). The reliability of the videos was evaluated with the modified DISCERN (mDISCERN).^[13] The quality of the videos was assessed using the global quality scale (GQS), a widely used scale that assesses the quality of content and the usefulness of online data. If the total video score is 4 or 5, it is considered high

quality, 3 points as medium, 1 or 2 points as low quality.^[14] Like ratio was calculated as $(\text{like} \times 100 / (\text{like} + \text{dislike}))$, view ratio: $(\text{Number of views} / \text{days})$, and video power index was calculated as $(\text{like ratio} \times \text{view ratio} / 100)$.

In parallel with previous studies,^[13,14] the videos in this cross-sectional study are available on YouTube, a public platform, and ethics committee approval was not required because the study did not involve any human participants or animals. No personal data were collected in the analyzed videos.

Statistical Analysis

Statistical analysis was performed with IBM SPSS version 25.0. (IBM Corp., Armonk, NY, USA) Kolmogorov–Smirnov test was performed to test the normality. The mean and standard deviation, minimum, median, and maximum value of the data were calculated for continuous variables and number and percentages for categorical variables. According to the normality test results, One-way analysis of variance or Kruskal–Wallis test was used for compare groups. Dunn–Bonferroni *post-hoc* method was used for a significant Kruskal–Wallis test for pairwise comparison. The inter-rater agreement was assessed with the kappa coefficient. A $p < 0.05$ was considered statistically significant.

RESULTS

A total of 400 videos were analyzed by two researchers. 109 videos were excluded because of duplication, 108 videos were excluded because they were irrelevant, 6 videos were excluded because they were not in English, 4 videos were excluded because of poor sound and image quality, and 173 videos that met the evaluation criteria were included in the statistical analysis. Of the 173 videos included in the study, 37.5% were from physicians ($n=65$), 35.3% from other health-care professionals ($n=61$), 15.6% from independent users ($n=27$), and 11.6% from patients or patient associations ($n=20$). The target audience of 161 videos (93.1%) was patients and 12 (6.9%) health-care professionals.

Average total days of videos 1247.9 ± 913.5 , number of views 1730722.7 ± 4024547.5 , like numbers 35351.0 ± 85581 , dislike numbers 728.2 ± 1698.5 , subscribers' numbers 2779362.5 ± 9994302.3 , and comment numbers were detected as 1024.9 ± 2401.6 . The mean GQS score of the videos was 3.1 ± 1.0 , and the mDISCERN scores were 691.6 ± 938.9 . Cohen's kappa score for interobserver agreement was 0.792 for the GQS and 0.789 for the mDISCERN.

When the exercise video uploaders were divided into three groups as physicians, other health-care professionals, and non-medical users, total days, number of views, number of

Table 1. Comparison of the characteristics of the videos between groups

	Physicians ^a (n=65)	Other healthcare professionals ^b (n=61)	Nonmedical users ^c (n=47)	p	Post-hoc
Duration (sec)					
Mean±SD	567.8±221.4	744.9±1505.3	796.2±485.6	0.393	
Min/Med/Max	201/578.5/1346	87/492/11763	54/708/1950		
Total days					
Mean±SD	1045.6±766.5	1322.0±831.0	1452.2±1136.6	0.037	0.021 ^{a-b}
Min/Med/Max	103/823/3643	77/1017/3680	71/1372/4416		0.040 ^{a-c}
View number					
Mean±SD	1194450.6±2155013.0	873682.6±1811686.0	3620051.0±6714514.4	<0.001	0.004 ^{a-c}
Min/Med/Max	1300/452000/10859035	105/80018/9414496	183/623000/35029241		<0.001 ^{b-c}
Like number					
Mean±SD	26731.8±42519.1	17231.7±37847.9	71314.8±145455.6	0.003	0.016 ^{a-c}
Min/Med/Max	7/8760/163000	7/1369/145000	5/13866/757562		0.003 ^{b-c}
Dislike number					
Mean±SD	603.2±1167.5	385.0±749.4	1359.1±2755.3	0.009	0.008 ^{b-c}
Min/Med/Max	0/185/5847	0/25/3200	0/268/15659		
Subscribers number					
Mean±SD	2710863.1±12212256.3	2854675.3±10811743.4	2829942.1±4074167.8	0.996	
Min/Med/Max	324/1540000/98500000	43/167000/82400000	3630/847000/13100000		
Comments number					
Mean±SD	936.4±1510.4	436.6±857.1	1889.3±3981.3	0.008	0.006 ^{b-c}
Min/Med/Max	0/278/7389	0/83.5/3966	0/328/22327		
Video power index					
Mean±SD	1381.6±1812.1	639.1±1238.6	2853.8±4377.1	<0.001	0.012 ^{a-c}
Min/Med/Max	3.4/433.8/6260	0.6/72.8/4588	0.6/665.1/18082.1		<0.001 ^{b-c}

^{a-b}: Between physicians and other healthcare professionals; ^{a-c}: Between physicians and nonmedical users; ^{b-c}: Between other health-care professionals and nonmedical users. SD: Standard deviation

likes, and VPI values of non-medical users were found to be significantly higher than the other two groups (Table 1).

In the comparison of video quality between 3 groups, GQS scores were found to be significantly higher than physicians scores compared to other groups ($p<0.001$). According to mDISCERN scores, physicians scores were found to be significantly higher than other groups ($p<0.001$), while other healthcare professionals scores were found to be higher than non-medical users ($p=0.003$) (Table 2).

Since the videos were analyzed as low, medium, and high according to their quality, low-quality videos total days were found to be significantly higher than high-quality videos ($p=0.024$). View numbers ($p=0.009$), such as ($p=0.032$), dislike numbers ($p=0.013$), and comments numbers ($p=0.015$) were found to be significantly higher in medium quality videos than

in low quality videos. Since the upload date of high-quality videos is new, it is thought that the parameters such as the number of views, likes, dislikes, and comments are lower.

A negative correlation was found between the total days of the videos and the GQS ($r=-0.201$, $p=0.008$) and quality evaluation ($r=-0.182$, $p=0.017$) (Table 3).

DISCUSSION

In this study, exercise videos on YouTube for LBP were evaluated. The findings revealed that clinicians are newer to YouTube compared to non-medical users, exercise videos added by clinicians are of higher quality, low-quality videos are watched less, receive less likes, and have fewer comments.

Recently, non-pharmacological treatment options for LBP have been emphasized more in different publications and

Table 2. Comparison of the quality of the videos between groups

	Physiciansa n=65	Other healthcare professionalsb n=61	Nonmedical usersc n=47	p
GQS				
Mean±SD	3.78±0.95	2.88±1.01	2.46±0.73	<0.001
Min/Med/Max	1.00/4.00/5.00	1.00/3.00/5.00	1.00/2.50/4.00	<0.001 ^{a-b,a-c}
mDISCERN				
Mean±SD	3.07±1.05	2.27±1.02	1.63±0.64	<0.001 <0.001 ^{a-b,a-c} 0.003 ^{b-c}
Min/Med/Max	1.00/3.00/5.00	1.00/2.00/5.00	1.00/2.00/3.00	
Quality (%)				
Low	7 (10.8)	19 (31.1)	23 (48.9)	<0.001
Medium	13 (20.0)	20 (32.8)	20 (42.6)	<0.001 ^{a-b,a-c}
High	45 (69.2)	22 (36.1)	4 (8.5)	0.012 ^{b-c}

^{a-b}: Between physicians and other health-care professionals; ^{a-c}: Between physicians and nonmedical users; ^{b-c}: Between other health-care professionals and nonmedical users. GQS: Global quality scale; SD: Standard deviation

guidelines. Non-pharmacological options include patient education, exercise prescribing, ergonomics recommendations, activity, and workplace modifications.^[15]

In a meta-analysis examining the effectiveness of exercise in LBP, it was seen that core strengthening, general strengthening, aerobics, Yoga, McKenzie, and stretching exercises were recommended to patients as exercise. Among these exercises, pilates and McKenzie exercises were found to be the most effective for reducing pain and functional limitation in patients with non-specific LBP.^[16]

Although the positive effects of exercise have been shown in non-specific LBP, the patient's exercise adherence may be low. The reasons for low exercise adherence were found to be inadequate patient education, personality traits, inappropriate target setting, poor patient–doctor communication, working environment, and low education level.^[17] It has been determined that features such as the use of appropriate technology, communication and challenge, visual and auditory feedback, and active participation are important to increase exercise adherence in chronic diseases and older adults.^[18] YouTube can become a tool to increase exercise adherence in patients with LBP with visual and auditory feedback, communication, information, and easy-to-use features.

In studies investigating the quality of patient information, surgical interventions, and therapeutic exercise videos, the video quality was generally found to be low, and it was determined that the videos uploaded by clinicians were of higher quality.

^[19,20] In this study, similar to the literature, it was determined that the videos uploaded by the clinicians were of higher quality. In addition, it was determined that the videos uploaded by the clinicians were more recent. It is predicted that the video quality will increase with clinicians' more participation in social media, and in parallel, patients will benefit more from these videos.

LBP, which constitutes a significant burden on health expenditures, has been associated with treatment expenditures (surgical or non-surgical) as well as social expenditures.^[21] Loss of work force, disability, decrease in quality of life, loss of productivity, anxiety, and depression seen in patients due to LBP constitute an invisible but important part of health expenditures.^[22] Cost-effective treatment methods are of great importance to reduce the burden on health systems.^[23] It may be possible to achieve this goal with quality videos and patient information on frequently used social media platforms such as YouTube. Therefore, it is important to increase the quality of the videos in these areas.

The results of this study showed that clinicians uploaded videos to the YouTube platform an average of 3 years ago. It has also been observed that clinicians upload more videos than non-medical users in the past 3 years. In this 3-year period since the beginning of the pandemic, there have been changes in health services as well as our social life. Studies evaluating the effectiveness of telerehabilitation in different musculoskeletal system diagnoses indicate that it may have comparable results with face-to-face rehabilitation.^[24]

Table 3. Comparison of the characteristics of the videos according to the video quality groups

	Low quality ^a (GQS<3) n=48	Medium quality ^b (GQS=3) n=53	High quality ^c (GQS>3) n=71	p
Duration (sec)				
Mean±SD	741.6±1679.59	661.2±373.9	683.9±405.9	0.908
Min/Med/Max	54/358/11763	146/565/1718	247/632/2774	
Total days				
Mean±SD	1425.4±1016.73	1356.5±949.7	1058.1±776.3	0.048
Min/Med/Max	140/1178/4416	71/1108/4041	97/871/3680	0.024 ^{a-c}
View number				
Mean±SD	792130.8±1446256.82	3123469.4±6398518.7	1362225.9±2433017.2	0.008
Min/Med/Max	105/107300/6532000	183/198600/35029241	724/345267/10729000	0.009 ^{a-b}
Like number				
Mean±SD	18162.2±38531.71	60874.2±138293.3	28389.5±45074.7	0.028
Min/Med/Max	7/1053.5/161500	5/4452/757562	7/6200/163000	0.032 ^{a-b}
Dislike number				
Mean±SD	353.2±564.85	1302.4±2713.2	563.2±1012.5	0.010
Min/Med/Max	0/45.5/1908	0/121/15659	0/127/5779	0.013 ^{a-b}
Subscribers number				
Mean±SD	1715877.0±3448732.99	4142817.4±13703659.1	2516990.1±9777457.5	0.459
Min/Med/Max	1400/163000/13800000	43/679000/98500000	324/679000/82400000	
Comments number				
Mean±SD	432.2±913.59	1772.2±3864.7	898.3±1412.5	0.017
Min/Med/Max	0/64.5/4374	0/145/22327	0/233/7389	0.015 ^{a-b}
Video power index				
Mean±SD	894.2±1669.00	2173.6±3822.2	1456.5±2330.2	0.065
Min/Med/Max	0.06/72.9/7932.6	0.6241.4/18082.1	1.1/245.0/13908.8	

^{a-b}: Between low quality and medium quality; ^{a-c}: Between low quality and high quality; ^{b-c}: Between medium quality and high quality. GQS: Global quality scale; SD: Standard deviation

This study has some limitations. The inclusion and evaluation of English videos are a factor that may affect the general applicability of the results, and it should be noted that the data obtained from YouTube are dynamic and will change day by day. The strength of this study is that more videos were watched and analyzed compared to previous studies.^[25]

CONCLUSION

In this study, the quality of LBP therapeutic exercise videos on YouTube was evaluated and it was determined that the quality of the videos was generally low. It was determined that clinicians joined this platform later than non-medical users, but the videos they uploaded were of higher quality. Health professionals should be more aware of the indi-

vidual and societal importance of videos on therapeutic exercises on YouTube and provide high quality, up-to-date, and scientific content.

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