

# Accuracy and Reliability of YouTube Videos as an Information Source for Osteoporosis

## Youtube Videolarının Osteoporoz için Bilgi Kaynağı Olarak Doğruluğu ve Güvenilirliği

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### Abstract

**Objectives:** There is a little data available in the literature investigating videos related to osteoporosis in the internet media. The present study investigates the characteristics and scientific accuracy of the videos related to osteoporosis, which have been uploaded and broadcast on the YouTube website.

**Materials and Methods:** The key word "osteoporosis" was searched in February 2016 on the YouTube browser without any filters. The contents of the recruited videos were assigned to three groups, including general information, preventing the disease, and treatment; while their usefulness was classified as useful, moderately useful and not useful.

**Results:** Two hundred and thirty-seven (47.4%) videos formed the study group. Sixty-four point one percent of these videos contained definitive and diagnostic information about the disease, and 87% included preventative suggestions. It was noted that 56.9% of the videos had content related to treatment. Regardless of uploaders, the videos about osteoporosis were found to be low scores but when the videos were grouped according to uploaders; the videos, which were uploaded by the governmental and official institutions or associations had the highest diagnostic, preventing and treatment scores.

**Conclusion:** It cannot be proclaimed that the videos, which are related to osteoporosis, inform people accurately enough. It seems crucial that videos giving information about health on such websites as YouTube, should be controlled beforehand or that more public viewing of videos uploaded by the governmental and official institutions should be ensured. Considering the large volume of information gathering from this type of internet source, by arranging the necessary regulations, video sharing websites may become more useful in public education.

**Key Words:** Osteoporosis, YouTube, Video, Internet, Quality

### Öz

**Amaç:** Literatürde internet ortamındaki osteoporoz ile ilgili videoları araştıran çok az veri bulunmaktadır. Bu çalışma, YouTube web sitesine yüklenen ve yayınlanan osteoporoz ile ilgili videoların özelliklerini ve bilimsel doğruluğunu araştırmayı amaçlamaktadır.

**Gereç ve Yöntem:** "Osteoporoz" anahtar kelimesi Şubat 2016'da herhangi bir filtre kullanılmadan YouTube tarayıcısında aranmıştır. Değerlendirmeye alınan videolar, genel bilgi veren, hastalığı önleyici ve tedavi bilgilendirmesi olmak üzere üç kategoriye ayrılmış; kaliteleri ise yararlı, orta derecede yararlı ve yararlı değil olarak sınıflandırılmıştır.

**Bulgular:** İki yüz otuz yedi video (%47,4) çalışma grubuna dahil edilmiştir. Bu videoların %64'ü hastalık için tanımlayıcı ve tanısal bilgiler içermektedir ve %87 oranında video ise koruyucu öneriler içermekte idi. Videoların %56,9'unun tedaviyle ilgili içerik barındırdığı saptanmıştır. Yükleycilerden bağımsız olarak, osteoporoz ile ilgili videoların genel olarak düşük kaliteli olduğu görülmüştür; ancak videolar, yükleyicilere göre gruplandırıldığında; devlet ve resmi kurumlar veya dernekler tarafından yüklenen videoların en yüksek tanı, önleme ve tedavi bilgilendirme puanlarına sahip olduğu görülmüştür.

**Sonuç:** Youtubedaki osteoporoz ile ilgili videoların, kullanıcıları doğru bir şekilde bilgilendirdiği söylenemez. YouTube gibi web sitelerinde sağlık hakkında bilgi veren videoların içeriklerinin kontrol edilmesi veya devlet kuruluşları ve resmi kurumlar tarafından yüklenen videoların daha fazla kişi

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tarafından izlenmesinin sağlanması gerekli gözükmektedir. Bu tür internet kaynaklarından büyük miktarda bilgi edinildiği düşünüldüğünde, gerekli düzenlemelerin yapılması, video paylaşım web sitelerini halk eğitiminde daha faydalı hale getirebilir.

**Anahtar Kelimeler:** Osteoporoz, Youtube, Video, İnternet, Kalite

## Introduction

Osteoporosis is a disease characterized by low bone mass and micro architectural deterioration of bone tissue (1). Osteoporosis is estimated to affect 200 million women worldwide, which is approximately one-tenth of women aged 60 and one-fifth of women aged 70 (2). It is a silent disease until complicated by fracture. Osteoporosis accounts for more than 8.9 million fractures annually, resulting in an osteoporotic fracture every 3 seconds (3). Because of the morbid results of osteoporosis, protection from this disease and related fractures in the elderly population is considered necessary to sustain the quality of life (4). Today, with the increasing usage of the internet, more people can easily gain access to information about their health. The internet surpasses all other traditional health information resources (the social environment, TV, radio, magazines, encyclopedias, medical books, medical providers, etc.) and it is considered to be the preferred alternative source for health information (3,5). The internet and websites are of importance in terms of providing a physician-patient relationship, indirectly. It is claimed that eight out of ten American adults have sought medical information on the internet (6). YouTube has more than one billion users and continues to be one of the three most commonly used internet video sites. Besides this, the absence of the editorial evaluation of videos uploaded to such sites also continues to be the subject of discussion in the literature about their qualification to inform the public (7). Due to its prevalence worldwide, osteoporosis is considered to be a serious public health concern, and however, in the literature there is no assessing study about osteoporosis on YouTube (8). The aim of this study was to evaluate the adequacy of the videos on YouTube about osteoporosis according to the "Clinician's Guide to Prevention and Treatment of Osteoporosis".

## Materials and Methods

In this cross sectional study, the term "osteoporosis" was searched for in February 2016 with the standard YouTube search setting "relevance", without any filtering. Five hundred videos in the first 25 pages (20 in each page) were viewed and evaluated for the study.

A total of 500 videos were evaluated regarding the exclusion criteria, which yielded 237 eligible ones. The characteristics of the videos, including the uploading date, duration, like/dislike numbers, number of visualizations, identity of loaders, content (general information, preventing information, treatment

information) and presence of animations were recorded and evaluated.

### Usefulness of the Videos Uploaded

To evaluate the usefulness of the video and, at the same time, to achieve an objective assessment, a scoring chart was obtained by summarizing the main headings of the "National Osteoporosis Foundation's Osteoporosis Guideline" published in 2014 (Table 1).

The contents of the videos were assigned into three groups: diagnostic information, prevention recommendations and treatment information. The usefulness of the videos was evaluated by giving one point to each item in the video for these three categories. The diagnostic videos were evaluated and given a mark on a scale of 0 to 5. Videos with 0-1 scores were considered not to be useful, videos with the score of 2-3 were considered as moderately useful, and those with scores of 4-5 were considered to be useful. The videos, including preventing recommendations, were evaluated and given a mark

**Table 1: The scoring criteria used for assesment of video qualities\***

#### Diagnostic information quality assessment checklist

- What is osteoporosis?
- Information about bone mineral density test?
- Information about vertebral imaging should be performed whom?
- Secondary causes of osteoporosis
- Biochemical markers of bone turnover

#### General recommendation / Preventing information quality assessment checklist

- Counsel on the risk of osteoporosis and related fractures.
- Advise on a diet that includes adequate amounts of total calcium intake
- Advise on vitamin D intake
- Recommend regular weight-bearing and muscle-strengthening exercise to improve agility, strength, posture and balance; maintain or improve bone strength; and reduce the risk of falls and fractures
- Assess risk factors for falls and offer appropriate modifications (e.g. home safety assessment, balance training exercises
- Advise on cessation of tobacco smoking and avoidance of excessive alcohol intake

#### Treatment information quality assessment checklist\*\*

- Pharmacologic treatment recommendations
- Physical medicine and rehabilitation
- Information about vertebral imaging should be performed whom?
- Secondary causes of osteoporosis

\*Based on 2014 national osteoporosis foundation clinicians guide to prevention and treatment of osteoporosis

\*\*includes information about one of them: Bisphosphonates, calcitonin, Estrogen/ Hormone Therapy (ET/HT) Estrogen Agonist/Antagonist (formerly known as SERMs): Raloxifene

on a scale of 0 to 6. Scores 0 to 1 indicated that they were not useful, scores of 2-3 were moderately useful, and scores of 4-5-6 were considered to be useful. For treatment videos, a 0 score was considered to be not useful, 1 score was moderately useful, 2 scores, which included both medical and physical therapy modalities, were considered to be useful. As the medical treatment information was evaluated, videos mentioning any of the following treatments received 1 point: bisphosphonates, hormone therapy and estrogen agonist treatment. During physical assessment, weight-bearing exercises to increase muscle strength, and exercises to decrease the risk of falls like postural imbalance exercises were taken into account.

### Statistical Analysis

All statistical analyses were conducted using Statistical Package for the Social Sciences version 10.0. Descriptive statistics (frequencies, percentages, median, first and third quartiles (Q25, Q75), minimum and maximum values) were performed. For the comparison of variables, the Shapiro-Wilk test was used first to assess the normal distribution of data. Kruskal-Wallis test with post-hoc Mann-Whitney U tests with the Bonferroni correction was performed for to determine statistical significance between groups.  $P < 0.05$  was considered statistically significant.

## Results

Two hundred and sixty-three (52.6%) of the 500 videos screened by the researchers were excluded from the study for various reasons (Figure 1). Two hundred and thirty-seven (47.4%) videos formed the study group and the identifying information of these videos and scores they received are presented in Tables 2 and 3.

Of these Youtube videos, 31.65% were uploaded by the health-care professionals, while 29.96% of them were uploaded by the website. When evaluated in terms of content, it was found

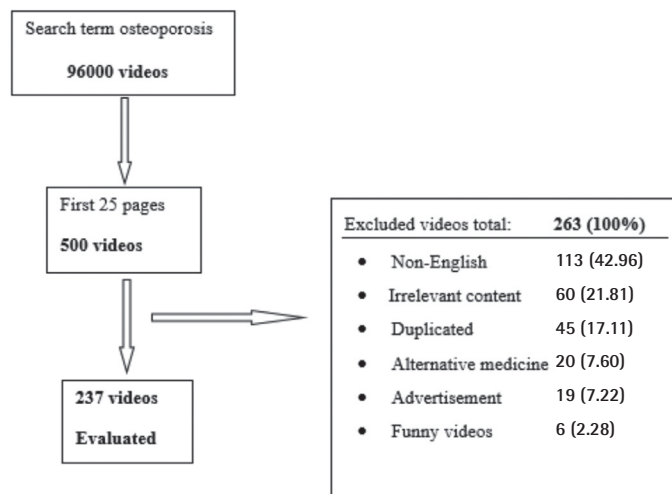


Figure 1: Flow chart of determination of videos included in the study

that 64.1% of the videos contained definitive and diagnostic information about the disease, 87.3% included preventative suggestions and 56.9% of the videos had content related to treatment (Table 2).

The most viewed videos were Internet videos, while videos from official government institutions were the least viewed. It was seen that the videos uploaded by health-care professionals were the second most viewed videos. Regardless of uploaders, the videos about osteoporosis were found to be low information quality scores (Table 3).

When the durations of the videos were compared, videos uploaded by the official government institutions were statistically significantly longer than those uploaded by other sources ( $p < 0.001$ ). Videos uploaded by health professionals and internet websites received the most likes and dislikes, while videos receiving the least likes were uploaded by the government/official institutions. According to uploaders the videos, which were uploaded by the governmental and

Table 2: Characteristics of the videos included in the analysis

	n	%
<b>Date (year) uploaded</b>		
2013 and earlier	145	61.18
2014	39	16.46
2015-2016 (first 2 months)	53	22.36
<b>Individual or institution uploaded the item</b>		
Healthcare professional(s) (physician, nurse etc.) and hospital	75	31.65
Lay people	46	19.41
Governmental/official institution/associations	34	14.35
Television	11	4.64
Internet websites	71	29.96
Animation videos	35	14.77
<b>The content of the videos</b>		
Provides diagnostic information about disease	152	64.14
Provides preventing recommendations	207	87.34
Provides information on the treatment	135	56.96

Table 3: Descriptive statistics of videos uploaded

	Median (Q25-Q75)	Min-max
View	1455 (353-6482)	0-583398
Online day	950.8 (365-1460)	5-3285
Duration (sec)	227 (129-562.5)	30-5636
Like	5 (1-25.5)	0-481
Dislike	0 (0-2)	0-35
Diagnostic score	1 (0-3)	0-5
Preventing score	2 (1-4)	0-6
Treatment score	1 (0-1)	0-2

official institutions or associations had the highest diagnostic, preventing and treatment scores ( $p<0.001$ ). It was observed that videos uploaded by lay people were the poorest quality in terms of diagnostic, preventing and treatment information. Viewing rates of the videos according to uploaders, comparisons of likes, dislikes, durations and content scoring are shown in Table 4.

## Discussion

In this study, videos about osteoporosis on YouTube were evaluated separately according to diagnosis, preventing and treatment information, and were found to be rather insufficient in terms of public enlightenment. Regardless of uploaders, total information quality scores of the videos were found to be low. Our literature screening revealed that there was no similar previous study about osteoporosis. The information scores of the government/official institute videos were found to be rather high. It is worth noticing that similar results were obtained in studies where videos about other orthopedic diseases (FAI, lumbar discectomy, scoliosis) were evaluated (9,10). Because of the rather high number of videos entitled with specific headings, such as "What is Osteoporosis?", "Preventing Osteoporosis" or "Osteoporosis Treatment" on websites like YouTube, the videos were assessed under the headings of diagnosis, prevention and treatment in the present study.

When the videos were analyzed according to uploaders, the information scores of the government/official institute videos were found to be rather high. However, unfortunately, the viewing frequencies of these videos were found to be lower compared to other videos. Numerous similar studies reported that videos uploaded on YouTube by official institutions/universities contained accurate and reliable information. Although there was a difference between the information levels of the videos, the like/dislike rates of these videos did not differ. We found that the videos, which were uploaded by

websites, were the videos that were most commonly watched or clicked on by YouTube users. It can be suggested that these videos were watched more frequently because they have more animation and visual effects. In a study of videos about scoliosis, Staunton et al. (11) found that videos of lower quality had a higher viewing rates than those of higher quality. These authors suggested that presenting high-quality information is more challenging, and this, in turn, directly influences the viewing ratings. Furthermore, video uploaders can receive financial gains based on the number of the viewing ratings of the videos on YouTube. It can be assumed that commercial video uploaders (such as TV shows, websites, the internet and lay people, etc.) upload attractive, animated videos with short durations to increase viewing frequencies, without paying too much attention to giving accurate information. A study reported that non commercial sources on health information tend to be more reliable and qualified than commercial ones (12). Contrary to expectations, some studies, in which medical videos on websites were investigated, reported that the videos, which had been uploaded by health professionals were of lower quality (11).

Studies also reported that most internet users do not check the fundamental issues, such as the validity of the information sources or publishing date (13-15) and in addition, most of them perceive the health information on the Internet as having "good" or "perfect" quality (5,16). Regarding this false and or lack of information, it has been reported that the education of the people obtaining knowledge from the internet and online content producers can help to reduce the spread of low-quality information on the internet (17). It can be assumed that criteria should be established in order to evaluate the health information, which is available on the internet, and professional supervision should be conducted. In addition, efforts must be made to ensure that patients receive the information from reliable sources.

**Table 4: Comparison of the download rates, like and dislike, duration and information quality score of the videos according to uploaders**

	Healthcare professional Median (Q25 -Q75)	Lay People Median (Q25-Q75)	Governmental/ official institution Median (Q25-Q75)	Television Median (Q25-Q75)	Internet Median (Q25-Q75)	p
Download rates	1319 (436-5506)	2120 (340-4303)	666 (186-6703)	633 (162-2751)	20120 (470-9562)	0.217
Online day	720 (330-1095)	970 (365-1825)	725 (333-1125)	1400 (715-1460)	730 (365-1310)	0.065
Duration(sec)	287 (162-662)	196 (106-339)	1159 (234-3558)	187 (134-236)	196 (93-324)	<0.001*
Like	5 (1-57)	7 (1-22)	3.5 (1-11)	5 (0-10)	3 (1-26)	0.565
Dislike	0 (0-3)	0 (0-1)	0 (0-1)	0 (0-1)	0 (0-2)	0.330
Diagnostic score (0-5)	1 (0-2)	0 (0-1)	4 (2-4)	1 (0-2)	1 (1-2)	<0.001*
Preventing score (0-6)	2 (1-4)	1 (1-2)	5 (4-6)	1 (0-2)	1 (1-2)	<0.001*
Treatment score (0-2)	1 (0-1)	0 (0-1)	1 (1-2)	1 (0-1)	0 (0-1)	<0.001*

Q25: first quartile, Q75: third quartile

\*The post-hoc analysis revealed that "governmental/official institution/associations" are significantly different from others

### Study Limitations

It must be kept in mind that the content of data concerning YouTube is constantly changing according to the screening date and time. Furthermore, screening was performed in the first 25 pages of the website using the key word "osteoporosis", so that all videos about osteoporosis could not be examined on YouTube.

### Conclusion

It can not be proclaimed that the videos, which are related to osteoporosis, inform people accurately enough. It seems crucial that videos giving information about health on such websites as YouTube should be controlled beforehand or that more public viewing of videos uploaded by academicians or health institutions should be ensured. Considering the large volume of information gathering from this type of internet source, by arranging the necessary regulations, video sharing websites may become more useful in public education.

### Ethics

**Ethics Committee Approval:** Ethical approval was obtained from Pamukkale University, Faculty of Medicine Noninvasive Ethics Committee (approval number: 23 and date: 29.12.2015)

**Informed Consent:** In this study, videos on Youtube was evaluated and informed consent was not obtained because there is no patient.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Concept: A.Ç.Y., Design: A.Ç.Y., Data Collection or Processing: A.Ç.Y., S.U.U., Analysis or Interpretation: A.Ç.Y., S.U.U., Literature Search: A.Ç.Y., S.U.U., Writing: A.Ç.Y., S.U.U.

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