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Evaluation of the Information Content of Youtube™ Videos in Turkish on Botulinum Toxin Injection Administered to the Masseter Muscle in the Treatment of Bruxism: A Cross-Sectional Study: Bruxism and Botox on Youtube™

Bruksizm Tedavisinde Masseter Kasına Uygulanan Botulinum Toksin Enjeksiyonu Konusunda Türkçe YoutubeTM Videolarının Bilgi İçeriğinin Değerlendirilmesi: Kesitsel Çalışma: YouTube Üzerinde Bruksizm ve Botoks

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ABSTRACT

Objective: The study aims the evaluation the content on the YouTube™ platform about botulinum toxin injection for the treatment of bruxism regarding information quality.
Methods: The Youtube™ database was scanned using the keyword "masseter botox." According to the study criteria, 33 videos were included and the number of views, likes, dislikes, comments, duration, and the number of days since uploading were recorded. According to their quality, the information content was divided into four groups (bad, poor, good, excellent). Shapiro-Wilk, Kruskal-Wallis, and post-hoc Tamhane-T2 tests were used to analyze the study data, and Fleiss Kappa analysis was used to evaluate the agreement between researchers. Statistical significance was determined as *P*<.05.
Results: According to the installer source, 19 videos were uploaded by doctors, seven by patients, five by doctors+patients, and two by other sources. Significant differences were obtained between the uploaded source and the duration of the video; the number of views, the number of likes, dislikes, comments, interaction index, and viewing rate were respectively *P*< .001, p=0.035, p=0.003, p=0.008, p=0.002, p=0.007, and p=0.013. According to the information content, 14 videos were bad, 15 were poor, and four had good information. A significant difference was observed between the number of comments (p=0.016) and video duration (p=0.029) regarding the information content quality.
Conclusion: The results have indicated that YouTube™ content cannot be a reliable source of information. Experts should recommend videos that meet specific standards to patients and produce content that provides accurate information in the absence of this content.

Keywords: Masseter muscle; Botox; Bruxism; Internet; Social Media

ÖZ

Amaç: YouTube™ platformunda yer alan, bruksizm tedavisi için botulinum toksin enjeksiyonunu konu alan içeriklerin bilgi kalitesi açısından değerlendirilmesidir.
Yöntem: YouTube™ veritabanı ''masseter botoks'' anahtar kelimesi kullanılarak taranmıştır. Sonuçlar içinden tespit edilen ilk 60 video incelenmiştir. Dahil etme ve dışlama kriterleri doğrultusunda 33 video çalışmaya dahil edilmiştir. Dahil edilen her bir videonun izlenme sayısı, beğeni, beğenilmeme ve yorum sayısı, süresi, yüklenmeden itibaren geçen gün sayısı kaydedilmiştir. Bilgi içerikleri kalitesine göre dört gruba (kötü, zayıf, iyi, mükemmel) ayrılmıştır. Çalışma verilerinin analizinde Shapiro-Wilk, Kruskal-Wallis, post-hoc Tamhane T2 testleri kullanılmış, ayrıca araştırmacılar arasındaki uyumun değerlendirilmesi içinse Fleiss Kappa analizinden yararlanılmıştır. İstatistiksel anlam düzeyi *P*<0,05 olarak belirlenmiştir.

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Bulgular: Yükleyici kaynağa göre; 19 videonun doktorlar, 7 videonun hastalar, 5 videonun doktor+hastalar ve 2 videonun diğer kaynaklar tarafından yüklendiği görülmüştür. Yükleyen kaynak ile video süresi, izlenme sayısı, beğenme, beğenmeme, yorum sayısı, etkileşim indeksi ve izlenme oranı için sırasıyla, *P*<0,001, p=0,035, p=0,003, p=0,008, p=0,002, p=0,007 ve p=0,013 değerleri ile anlamlı farklar bulunmuştur. Bilgi içeriklerine göre; 14 videonun kötü,15 videonun zayıf ve 4 videonun iyi bilgi içeriğine sahip olduğu görülmüştür. Bilgi içeriği kalitesine göre yorum sayısı (p=0,016) ve video süresi (p=0,029) parametreleri arasında anlamlı fark gözlenmiştir.
Sonuç: Yükleyen kaynağa kıyasla uzmanlar tarafından yüklenen içerikler daha kaliteli bilgiler sunsa da sonuçlarımız YouTube™ içeriklerinin güvenilir bilgi kaynakları olamayacağını göstermiştir. Uzmanların hastalara belirli standartları karşılayan videoları önermeleri ve bu içeriklerin yokluğunda ise doğru bilgi sunan içerikler üretmeleri gerekmektedir.

Anahtar Kelimeler: Masseter kası; Botoks; Diş gıcırdatma; İnternet; Sosyal Medya

INTRODUCTION

Bruxism is a dysfunctional, repetitive activity of the masticatory muscles characterized by clenching or grinding teeth. Bruxism may be observed as sleep bruxism or wakefulness bruxism. [1]

Regarding the etiology of bruxism, many theories, such as stress, malnutrition, allergic and endocrinological diseases, central nervous system disorders, genetic factors, drugs, malocclusion, and incorrect dental treatments, have been discussed[2]. However, the theories put forward about the cause of bruxism have not been proven, and the cause of the disease remains unclear. [3]

As a result of teeth clenching and grinding; Undesirable conditions such as overloading the stomatognathic system, pain in the jaw joint, increased mobility in the teeth, pathological migration and wear of the teeth, masticatory muscle disorders, persistent headaches, dental restoration fractures and aesthetic problems due to masseter muscle hypertrophy may occur.[1,4]

For the treatment of bruxism, occlusal adjustment, occlusal splints, balance therapy, psychotherapy, physical therapy, relaxation training, restorative treatments, pharmacological treatments, biofeedback therapy, and botulinum toxin injection methods have been utilized.[5]

Clotulinum neurotoxins (BoNTs) are protein neurotoxins produced by neurotoxigenic strains of anaerobic and spore-forming bacteria of the genus Clostridium (Clostridium botulinum, Clostridium butyrricum, Clostridium barati, and Clostridium argentinensis). It is a potent biological exotoxin. Due to the experimental studies, the American Food and Drug Administration (FDA) licensed 'Botox' in 1989 to treat blepharspasm.[6] During the following years, the indications of the agent have expanded, and many medical and aesthetic indications have been defined. Also, Botox injection into the masseter muscle for bruxism is among these indications.

Botox injections into the masseter and temporal muscles for hypertrophy reduction, myorelaxation of these muscles and administration in treating bruxism have become popular in recent years.[7]

Information about these aesthetic and medical treatment methods can be obtained from different sources such as doctors, dentists, television programs, and the websites of health institutions.

In today's world, it has become easy and fast to attain information by accessing the internet without any usage restrictions. In the early 2000s, the internet became a platform that provides interaction between users, and the number of people accessing the internet from 2000 to 2020 exceeded 4.5 billion.[8]

Training models for watching video content are included in practical dentistry training today.[9] Similarly, social networking platforms such as YouTube™ (Google LLC, San Bruno, California), Google™ (Mountain View, California), and Facebook™ (Facebook, Menlo Park, CA) are popular websites where patients can learn extensively about masseter botox injections for bruxism with visual contents.[10]

According to the data we have obtained from the database research, although several publications analyze the benefit and effectiveness of YouTube™ videos on botulinum toxin injections for the treatment of bruxism, there has yet to be a study investigating videos in Turkish. This study aims to evaluate the content and quality of the information in Turkish YouTube™ videos about masseter Botox injections.

In addition, during the research process of this study, it was observed that the number of Turkish videos about masseter botox was less than the English videos. However, this condition is altering daily and more videos with medical content in Turkish are being produced. Also, with the obtained results of this study, it is aimed to determine the adequacy of Turkish video content, and which aspects are missing to enhance the current content quality.

METHODS

Study Design and Sampling

The current study data were obtained with a search on the YouTube™ platform. The search was performed on 14 May 2022 using the keyword 'masseter botox,' and included videos containing information about masseter Botox injections. The search was conducted in incognito mode of the web browser and worldwide to avoid restrictions and obtain broad search results. Search results with keywords are sorted by display results.

Although it was determined that the most users who searched online generally viewed the first 30 videos and did not review the remaining results, the first 60 videos were included in the search results according to the number of views in terms of the efficiency of the current study. As a result of the inclusion criteria, 33 videos were included in the study. The purpose of reviewing the first 60 videos was that 95% of YouTube™ researchers reviewed the first 60 videos in the previous studies.[11]

Videos other than Turkish, repetitive videos, videos that do not contain speech-description-title and content information, Botox application videos made outside of the masseter region, videos over 20 minutes, and videos for advertising purposes were excluded from the study. Only Turkish videos and videos with acceptable video quality about masseter Botox were included.

According to the inclusion criteria, 12 videos were excluded because they were in languages other than Turkish, nine videos were longer than 20 minutes, two videos were only images and music and did not share audio information, two videos were replay videos, and two videos contained irrelevant content and advertising content.

The information content of YouTube™ videos was evaluated by a researcher (MSD), and independent of the results of this evaluation, evaluations were made by two other researchers (AE and SÇ) in a blinded manner. Fleiss kappa analysis was utilized to analyze the agreement-incompatibility among the three reviewers on video efficacy scores.

Study Variables and Data Analysis

For the analysis, the parameters of the videos included in the study; video title and URL information, video duration, upload date of the video, and source performing the upload (doctors [dentists, oral, dental

and maxillofacial surgeons, dermatologists, aesthetic, reconstructive, and plastic surgeons]), individual, TV channel, hospital, e.g.), the number of days since the upload date, the number of comments, the number of likes, the number of dislikes and the number of views were recorded.[12]

The interaction index and viewing rates were calculated using the data obtained.[12]

$$\text{Interaction index \%} = \frac{\text{Number of likes - Number of dislikes}}{\text{Number of views}} \times 100\%$$

$$\text{Viewing rate \%} = \frac{\text{Number of viewing}}{\text{Number of days since upload date}} \times 100\%$$

The information level of the videos included in the study was evaluated according to a scoring scale[10]. Each video was evaluated on a total of 8 criteria according to the scoring scale. According to the scoring scale, videos scored between 0-2 were interpreted to have bad information content, videos between 3-4 had poor information content, videos scored between 5-6 were good information content, and videos scored between 7-8 were found to have excellent information content (Table 1).

Three researchers (MSD, AE, and SÇ) viewed and analyzed the videos independently of each other. Therefore, each researcher is blinded to the other. In addition, the researchers were prevented from seeing the number of likes, dislikes, and comments before completing their video inference to make an objective assessment.

Since the study was conducted on an open-access website, ethics committee approval was not required in line with previous studies in the literature.[12,13]

Statistical Analysis

The normality distribution of the study data was analyzed with the Shapiro-Wilk test. The Kruskal-Wallis test was used to evaluate the quantitative data, and the Post-Hoc test (Tamhane's T2) was used to determine the differences between the groups. In addition, Fleiss Kappa analysis was utilized to evaluate the agreement between the reviewers. Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) was used for Fleiss kappa analysis, and IBM SPSS 24 (SPSS inc., an IBM Co., Somers, NY, USA) programs were used for the other statistical analyses. The statistical significance was determined as *P*< .05.

RESULTS

A total of 33 videos were reviewed according to uploader resource and usability scores. Of the included videos, 57.58% were uploaded by doctors, 21.21% by individuals, 15.5% by individual + doctor, and 6.06% by other users.

In Table 2, YouTube™ videos were evaluated as bad, weak, good, and excellent due to their information content. Of the videos, 42.42% were rated as bad, 45.46% as weak, and 12.12% as good. There was no video rated as excellent content.

The total number of views of the videos included in the study was 1,938,792, and the average number of views per video was 58,751. The total number of comments received by the videos was 4,570, and the total number of likes was 69,546. The mean number of likes was 2,107.

Evaluation Based On Uploader Source

The source who uploaded the video was classified as doctor, individual, doctor+individual, and the other (health center, tv channel, e.g.), and quantitative parameters were analyzed according to this classification.

The uploaded source and the duration of the video, the number of views, the number of likes, dislikes, comments, interaction index, and the rate of viewing were, respectively, *P*< .001, p=0.035, p=0.003, p=0.008, p=0.002, p=0.007 and p=0.013, and a significant relationship was detected between them (Table-1).

Post-hoc (Tamhane's T2) test was performed to determine the differences between the groups. It was observed that the video durations of individual and individual + doctor uploaders were significantly longer than the doctors and other users (p=0.025, p=0.000).

Evaluation Based on The Classification of the Information Contents

The videos were classified as bad, weak, good, and excellent according to the information content, and quantitative parameters were analyzed according to this classification.

A significant correlation was found between the classification of the information content, the duration, and the number of comments (Table 3).

Table 1. Topic Distribution of Evaluated YouTube™ Videos About Masseter Botox

Scoring item	Score points
Definition	1
Indications	1
Contraindications	1
Advantages	1
Related procedures	1
Complications	1
Cost	1
Prognosis and permanency	1
Total score	8

Evaluation of Video Contents

When the analyzed video contents are examined in terms of definition, indication, contraindication, advantage, procedure, complication, cost, and prognosis; Description in 15 videos (26.78%), indication in 24 videos (42.86%), advantages in six videos (10.71%), the procedure in five videos (8.93%), the complication in one video (1.79%), cost (1.79%), and prognosis in four videos (7.14%) were mentioned (Figure-1). The median score of the videos included in the study is 1.70 out of 8 (56/33).

Inter-Examiner Reliability

The Fleiss Kappa value used for the concordance-incompatibility analysis between the three reviewers who evaluated the videos was K: 0.79. This value indicates a significant degree of agreement.[14]

Table 2. Evaluation of YouTube™ Parameters based on video uploaders

Parameters	Doctor (n=19)		Individual (n=7)		Individual+Doctor (n=5)		Other (n=2)		*p* Value	
	Med	Min-Max	Med	Min-Max	Med	Min-Max	Med	Min-Max		
Duration (sec)	132	20-765	805	212-1178	843	632-1016	278.5	80-477	0.000	*
Views	22335	11562-98552	89402	18013-635163	56601	16863-154714	14491	11441-19541	0.035	*
Likes	49	1-13000	1800	94-16000	246	58-13000	23	20-26	0.003	*
Dislikes	2	0-26	9	2-1700	15	0-121	2.5	2 -3	0.008	*
Comments	4	0-753	193	60-1511	66	42-143	1	0 -2	0.002	*
Interaction index (%)	0.49	0-26	2.71	0.83-8.31	1.01	0.64-17.70	0.49	0.24-0.75	0.007	*
Viewing rate (%)	1383	269-60988	11274	1427-114739	15401	671-72739	791	680-903	0.013	*

*Indicates *P*<.05 significance level by Kruskal-Wallis Test

Table 3. Comparison of YouTube™ video properties based on information content scores

Parameters	Bad (n=14)		Poor (n=15)		Good (n=4)		*p* Value	
	Med	Min-Max	Med	Min-Max	Med	Min-Max		
Duration (sec)	132.5	20-1016	461	87-1178	635.5	409-849	0.029	*
Views	2093	11441-154714	4489	12693-635163	2661	12092-117499	0.403	
Likes	29	1-13000	114	17-16000	85	49-720	0.17	
Dislikes	2	0-75	8	0-1700	2.5	0-121	0.117	
Comments	1	0-367	66	1-1511	40.5	23-143	0.016	*
Interaction rate (%)	0.52	0-17.7	0.93	0.33-26.04	1.18	0.94-1.32	0.263	
Viewing rate (%)	1165	269-60988	3177	349-114739	821	371-72739	0.329	

*Indicates *P*<.05 significance level by Kruskal-Wallis Test

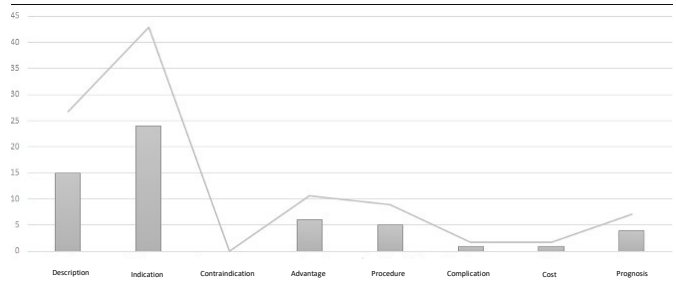

Figure 1. The Distribution of YouTube™ Video Contents

DISCUSSION

The primary purpose of this study was to evaluate the information quality and effects of Turkish-produced YouTube™ videos of botulinum toxin injection administered in the masseter muscle. Today, the use of Botox injections for medical and aesthetic purposes increases interest on the internet, especially in YouTube™ videos. Therefore, YouTube™ videos on the use of botulinum toxin for masseter Botox should be used as a reliable resource for patients.

According to the data we have obtained from the research, although several foreign publications analyze the benefit and effectiveness of YouTube™ videos on botulinum toxin injections for the treatment of bruxism, there is no study investigating Turkish videos.

According to database research, the current study is the first to evaluate Turkish videos about masseter Botox on the YouTube™ platform. In the last five years, eight publications, including botulinum toxin and YouTube™ video content, have been reached according to the research conducted in the PubMed database. One of these contents is the effect of Botox on gummy smile,[15] one of them is the effect of botox on bruxism,[10] two of them are about the general application areas of neurotoxins,[16,17] and four of them are YouTube™ studies on the cosmetic effect of botox.[18–21]

YouTube™, an open access video sharing platform, is becoming an increasingly popular host for healthcare videos.[22] YouTube™ has become the second most popular social media platform worldwide, with 2.3 billion users.[23]

Oral and maxillofacial surgeons have conducted several studies evaluating the quality of online video information contents regarding their expertises.[10,12] Long et al.,[24] Shim et al.,[25] and Asutay et al.[26] examined the impact of Botox administration on treating bruxism and reported that it could be used safely. However, in the current study, video contents were observed as 42.42% bad and 45.46% weak, revealing that the uploaded videos could not be considered so. It was observed that the videos contained almost no information, especially regarding complication, cost, prognosis, and contraindication criteria (Figure 1).

Although it is an issue, any video containing excellent information content could not be revealed. It is noteworthy that the number of videos with good content is low (n:4) and that these videos have longer durations (mean:632 sec) than videos with bad and poor content (n:29) (mean:387 sec). Similar to the present study, Gaş et al. [10] and Lena and Dindaroğlu[27] also reported that videos containing good information content have longer durations.

In studies conducted to date, significant relationships have been observed between the quality of YouTube™ video content and video duration.[28] In addition to the significant relationship between content and video duration (p=0.029), that for poor and good videos was significantly higher than the number of comments for bad videos (p=0.016). This difference between comments indicates that YouTube™ users put forth their efforts and likes to reach accurate information.

As a result of the literature review, it was observed that most of the videos evaluated in various disciplines had insufficient information content. According to the study conducted by Hegarty et al.[11] on orthognathic surgery, the conducted study on arthroscopy by Kunze et al.,[29] and the study conducted by Korkmaz et al.[30] on cleft lip and palate, YouTube™ videos contain poor information. They should not be considered reliable sources. The results of Hegarty, Kunze, and Korkmaz's studies represent similarities with the outcomes of the current study.

However, some studies indicate that video information contents on YouTube™ are sufficient or partially sufficient. The study conducted by Pons-Fuster et al.[31] on the relationship between diabetes and oral health and in pediatric dental injuries conducted by Tozar et al.[32] reported that the quality of videos uploaded by dentists and universities is higher than the other uploaders. In the current study, 2 of the four videos of good quality were uploaded by doctors and two by individual + doctor uploaders. Although this fact demonstrates the importance of the uploader source, 19 out of 33 videos were uploaded by doctors and five by individual+doctor. However, only four were included in the category of good-quality videos.

As mentioned above, similar studies conducted in other disciplines of dentistry and medicine also indicate that the information quality of YouTube™ video content needs to be improved and completed.[32] Consequently, these authors believe YouTube™ should not be considered a reliable source. However, in the current study, it was seen that the information content approached the more reliable limits partly in terms of the video uploader source. In order to enhance the quality of YouTube™ video content, physicians should be aware of the shared information and even prepare videos that contain accurate and sufficient information. Accurate and sufficient information requires knowledge of the definition of the procedure, indications, contraindications, advantages, application procedure, complications, cost, and prognosis. In addition, YouTube™ users should carefully review the health content and choose videos that meet the abovementioned criteria.

Considering the limitations of this study, initially, the outcomes of the current study may vary depending on the searched keywords. Using a different search term may yield different results. Videos added and deleted after the search date constitute the study's second limitation.

Determining YouTube™ content in different countries and languages is essential for research that will reflect the health-related pursuits of people from that culture on YouTube™. Therefore, it would be helepful to examine whether videos uploaded on YouTube™ about masseter Botox injections for different cultures can be used as a reliable source.

CONCLUSION

The interest in the examined YouTube™ videos indicates that in this period where access to information is increasing day by day, physicians should evaluate the medical accuracy and content quality (description, indication, contraindication, advantage, procedure, complication, cost, prognosis, e.g.) of YouTube™ videos about masseter Botox. As a result of this evaluation, experts in their fields are required to recommend videos that meet the standards. In the absence of this content, they are required to produce content that presents the correct information.

Etik Komite Onayı: Çalışma açık erişimli bir site üzerinden yapıldığından literatürde daha önce yapılan çalışmalarla uyumlu olarak etik kurul onayı gerekmemiştir.
Hasta Onamı: Bu çalışma, YouTube™ videolarını veri kaynağı olarak kullanan kesitsel nicel bir çalışma olduğundan, bilgilendirilmiş onam alınmamıştır.
Hakem Değerlendirmesi: Dış bağımsız.
Yazar Katkıları: Fikir – M.S.D.; Tasarım – M.S.D., A.E.; Denetleme – S.Ç.; Kaynaklar — M.S.D..; Malzemeler — A.E.; Veri Toplanması ve/veya İşlemesi –M.S.D. A.E., S.Ç..; Analiz ve/veya Yorum – . M.S.D. ; Literatur tarama – M.S.D..,.; Yazıyı Yazan – M.S.D. A.E.; Eleştirel İnceleme – A.E. S.Ç.
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Finansal Destek: Yazarlar, bu çalışma için finansal destek almadığını beyan etmiştir.

Ethics Committee Approval: Since the study was conducted on an open-access website, ethics committee approval was not required in line with previous studies in the literature
Informed Consent: Since this study is a cross-sectional quantitative study using YouTube™ videos as a data source, no informed consent was obtained.
Peer-review: Externally peer-reviewed.
Author Contributions: Concept - M.S.D.; Design - M.S.D. A.E..; Supervision – S.Ç.; Resources – M.S.D.; Materials – A.E.; Data Collection and/or Processing – M.S.D. A.E., S.Ç.; Analysis and/or Interpretation - M.S.D.; Literature Search – M.S.D..; Writing Manuscript - M.S.D. A.E..; Critical Review – S.Ç.
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