Evaluation of Turkish videos about breast self-examination on YouTube

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ABSTRACT

Objectives: Breast self-examination (BSE) is very important to early detect breast cancer in women in addition to imaging methods. The easiest way to access information concerning how to perform this examination is undoubtedly the internet, and the most popular platform is YouTube. However, the most important disadvantage of this massive platform is the risk of spreading false information since it cannot be audited. This study aimed to evaluate Turkish videos on BSE on YouTube in terms of quality and content.

Methods: On January 17, 2022, a search was conducted on YouTube using the keyword "breast self-examination", and the first 210 videos presented on the first five pages were obtained. After applying the study criteria, 156 were included in the sample and evaluated by two general surgeons in terms of educational value, content, and upload source.

Results: Of the 156 videos, 23 were categorized as useful (14.7%) and 133 as misleading (85.3%). When examined according to the upload source group, universities/professional organizations/non-profit physicians/physicians had the highest rate of misleading videos (96.9%), while stand-alone health information websites had the highest rate of useful videos (24%). There was no significant difference between the upload sources in terms of video length, number of views, content score, or quality score.

Conclusions: The number of useful Turkish videos on BSE is very low. Our results indicate the need for more educational and useful videos to be produced, especially by healthcare professionals who use the YouTube platform.

Keywords: Breast cancer, YouTube, video, usefulness, quality

Breast cancer is the most common cancer in women, with almost two million patients receiving this diagnosis every year [1]. In the USA, breast cancer constitutes the second most common cause of cancer-related deaths in women [2]. From the mid-1980s to 1999, there was an increase in the number of patients diagnosed with breast cancer, associated with the increase in screening in the USA [3]. Breast cancer mortality rates have decreased since the 1970s [4]. It is considered that this decrease in mortality is due to the increase in screening methods that allow for an early diagnosis and the developments in adjuvant therapy [5, 6].

Mammography and, when necessary, breast mag-

netic resonance imaging are used for breast cancer screening purposes across the world. In addition, breast examination by both clinicians and patients is important in practice. Despite there being no consensus concerning its benefits, breast self-examination (BSE) is essential for patients to become familiar with their breast structure and spot differences early. Although not included in direct screening methods, it is recommended to perform BSE to both increase awareness and support these methods. In fact, the World Health Organization recommends BSE not as a screening method but as a means of raising awareness among women at risk [7].

Certain guidelines have determined how BSE should be performed [8]. To ensure that individuals perform this examination accurately and thoroughly, it is essential to provide them with the appropriate education via healthcare professionals or other audio-visual platforms. Today, the internet, especially social video platforms, offers easy access to patients on many subjects. YouTube is unquestionably the leading and most popular video platform, with two billion views per day. On average, a new video is uploaded every minute, and the typical user spends at least 15 minutes per day on this platform [9].

Undoubtedly, health-related issues are also influenced by YouTube's popularity. The Health Information National Trends Survey reported a significant increase in internet use to access health information. Recent studies have found that eight out of 10 internet users access health information online [10, 11]. However, the greatest disadvantage of platforms such as YouTube is that the information presented does not pass any control mechanism in terms of accuracy and validity. Many researchers have expressed concerns regarding the accuracy and quality of the information available on this platform [12-15]. Many articles have been written on YouTube videos related to vaccination, the human papilloma virus, organ transplantation, swine flu, prostate cancer, and obesity [15-20]. The current study was conducted to evaluate the content, reliability, and quality of the most watched YouTube videos about BSE in Turkish, targeting the audience in Turkey.
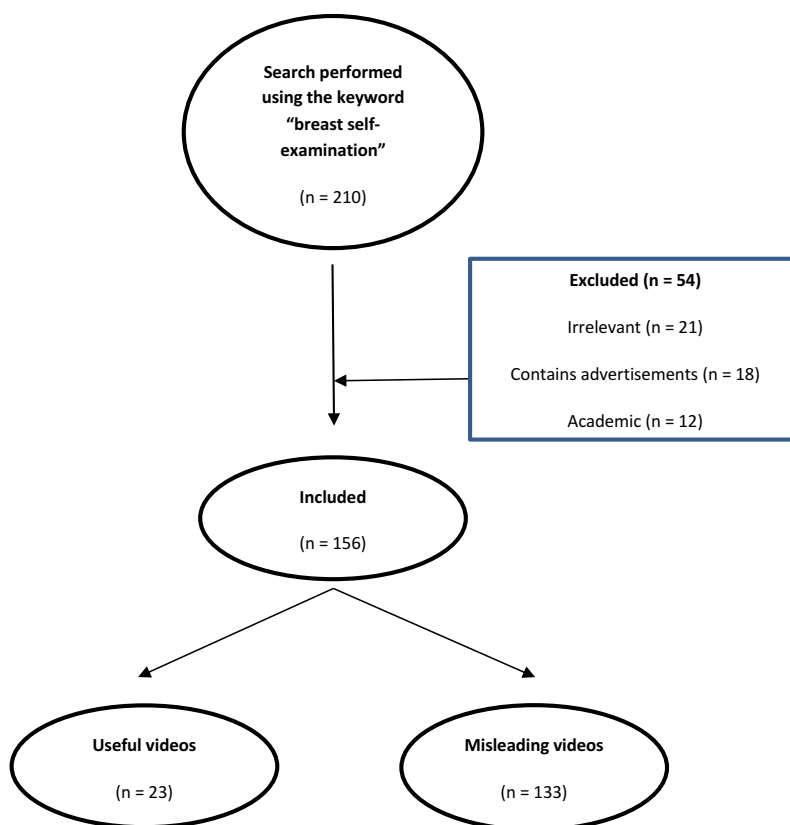

Fig. 1. Consort diagram

METHODS

On January 17, 2022, a search was undertaken on YouTube (https://www.youtube.com; YouTube, LLC, San Bruno, CA, USA) using the keywords "breast self-examination". Videos uploaded before 2017 were not included in the study. The videos were reviewed by two independent general surgeons, and a third general surgeon was consulted to reach a consensus, if necessary. The top 210 videos listed as a result of the search were included in the evaluation (Fig. 1). Only the first five pages were included in the study because previous research has shown that subsequent pages mostly contain unrelated videos and that viewers mostly watch videos presented in the first few pages [21, 22].

Exclusion Criteria includes uploaded videos before 2017, irrelevant, containing advertisements, uploaded for academic purposes, prepared in a language other than Turkish, and duplicated videos.

Video Evaluation

The evaluation of the videos in terms of their educational value was carried out by calculating the total video scores according to the criteria published by Azer [23]. As shown in Table 1, five major and six minor criteria were determined to evaluate the accuracy of the content, the clarity of the message given, whether expert opinion has been received on the subject, the informativeness of the video, and the technical design. Two points are awarded for each of the major criteria and one point for each of the minor criteria. Videos with a total score of 13 and above are categorized as useful, provided that all major criteria are met. These criteria have been successfully used for similar purposes in many previous studies [23-25]. For each video evaluated, the total number of views, time since upload, number of views per day, video length (seconds), and uploader characteristics were recorded. The popularity of the videos was evaluated using the Video Power Index (VPI). The following formulas were used for calculation:

VPI = popularity × views per day / 100

Popularity = number of likes × 100 / (likes + dislikes)

Views per day = total views/time since upload (days)

Characteristics of Upload Source

The videos were divided into four categories according to their upload sources: universities/professional organizations/non-profit physicians/physicians, stand-alone health information websites, medical advertisement/for-profit companies, and individual users.

Up-to-dateness and Accuracy of Video Content

All videos were evaluated by two independent general surgeons for information accuracy, up-to-dateness, and content (Table 2). In case of differences of opinion, a third expert was consulted to reach a consensus.

Video content (comprehensiveness score) was evaluated according to the following eight items, similar to previous studies [26]:

--The most appropriate time for BSE specified
--Complete removal of upper clothing
--Examination being performed in front of a mirror
--Looking at the external appearance of the breasts in the mirror
--Explaining how to perform a manual examination
--Examination being performed separately while lying down, sitting, and standing
--Discussing what to pay attention to during BSE
--Inclusion of the areola-nipple complex and the underarm in the examination.

Comprehensiveness score: Number of items included / 8 × 100 (%)

Statistical Analysis

The Statistical Package for the Social Sciences (IBM SPSS Inc., Chicago, IL, USA) v. 22.0 was used to analyze the data. The Shapiro-Wilk test was used to determine whether the data was normally distributed. Continuous variables were expressed as mean and standard deviation or median (interquartile range), and categorical variables were expressed as numbers and percentages. Kruskal Wallis test was used in the analysis of continuous variables. The Spearman correlation analysis was used to investigate the correlation between the total video score and basic video characteristics. Inter-rater agreement was calculated with Cohen's Kappa score. P<0.05 was considered statistically significant in all analyses.

RESULTS

According to the search on YouTube, a total of 210 videos were initially evaluated. Applying the exclusion criteria, 54 videos were excluded from the study. Of these, 21 were irrelevant, 18 contained advertisements, 12 were academic videos, and three were not in Turkish. As a result, 156 videos were included in the sample. Of these videos, 23 (14.7%) were categorized as useful and 133 as misleading (85.3%) (Fig. 1).

The inter-observer agreement of the total video scores for the BSE-related videos was found strong level (Kappa value: 0.841, 95% confidence interval: 0.839-0.842).

The number of views for the videos included in the study was 256 (59-2,680). The mean video length was 164 (110-357) seconds. The mean time since upload was 24 (12-52) months. The mean number of daily views was 0.49 (0.12-2.49). According to these statistics, the mean VPI was found to be 0.49 (0.12-2.49). The mean comprehensiveness score was 50 (25-75), and the mean total video score was 4 (5.5-8). Of the videos, 48.7% were presented by male speakers, 43.6% were presented by female speakers, and the remaining 7.7% did not have audio (Table 2).

When the number of views, video length, time since upload, daily views, VPI, comprehensiveness score, and total video score were examined according to the upload source, these values were determined to be 150 (30-695), 175 (114-686) seconds, 24 (12-48) months, 0.34 (0.07-1.04), 0.34 (0.07-1.04), 50.0 (6.25-75), and 5 (4-6), respectively, for universities/professional organizations/non-profit physicians/physicians; 156 (38-3,310), 163 (111-404) seconds, 27 (15-76) months, 0.53 (0.07-2.17), 0.53 (0.07-2.17), 50 (25.00-87.50), and 7 (4-11), respectively, for stand-alone health information websites; 507 (77-5,569), 146 (93-335) seconds, 28 (12-52) months, 0.77 (0.18-5.63), 0.77 (0.18-5.63), 50 (25.00-87.50), and 6 (4-7), respectively, for medical advertisement/for-profit companies; and 298 (95-1,069), 167 (128-290) seconds, 16 (9-52) months, 0.51 (0.23-2.33), 0.51 (0.23-2.33), 37.50 (25.00-75.00), and 5 (4-12), respectively, for individual users. There was no statistically significant difference between the upload source groups in terms of any of these variables (P>0.05) (Table 2).

Videos classified as useful and misleading were compared according to uploader characteristics. The highest rate of misleading videos belonged to universities/professional organizations/non-profit physicians/physicians (96.9%), with statistically significant differences when compared to stand-alone health information websites and individual users (76%, and 76.1%, respectively, P<0.05). The group with the highest rate of useful videos was stand-alone health information websites (24%). The rate of useful videos in this group was significantly higher than that detected for universities/professional organizations/non-profit physicians/physicians (3.1%, P<0.05) (Table 2).

Data are presented as median (25-75th percentile) or n (%). The Kruskal-Wallis test was applied. The same superscripts (a, b) denote a subset of categories that are not statistically significantly different from each other at the P=0.05 level. The chi-square test was applied.

The content of the videos was also examined to determine whether they covered the following topics: the most appropriate time for BSE, complete removal of upper clothing, examination being performed in front of a mirror, looking at the external appearance of the breasts in the mirror, explaining how to perform manual examination, examination being performed separately while lying down, sitting, and standing, dis-

Table 1. Evaluation of the global quality score of the videos according to Azer's criteria

| Major criteria: |
| --- |
| 1. Scientific accuracy of videos on BSE |
| 2. Quality of images |
| 3. Upload source being clearly specified |
| 4. Clarity of the topic discussed |
| 5. Quality of video sound and absence of background noises |
| **Minor criteria:** |
| 1. Video covering the topic specified in the title |
| 2. Designed at the level of medical undergraduate students |
| 3. Reasonable downloading/streaming time |
| 4. Up-to-date information available about the upload source |
| 5. Education goals specified |
| 6. BSM is shown on a real person rather than a picture |
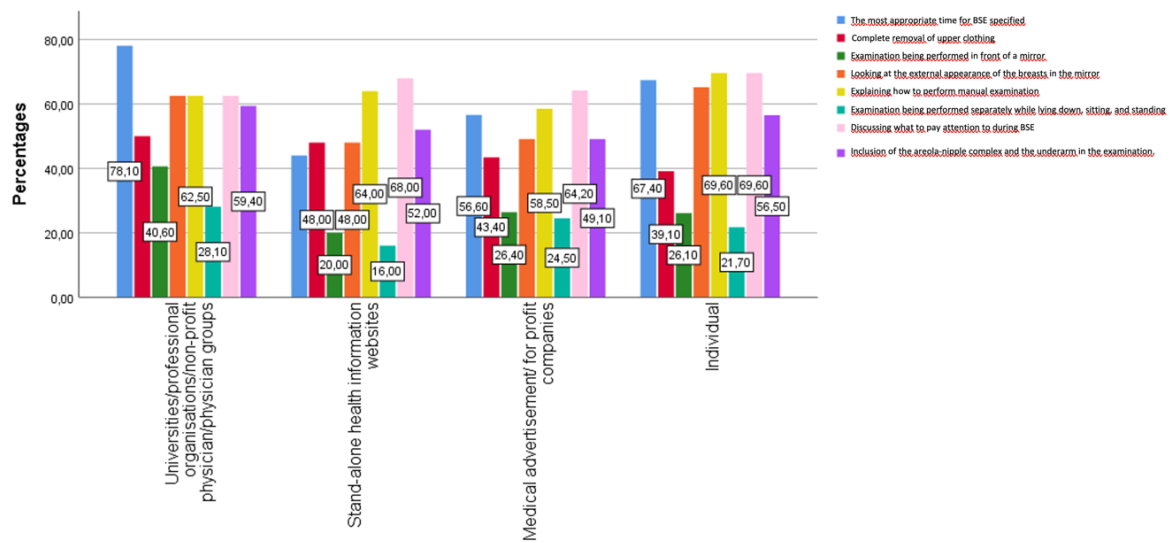
Fig. 2. Characteristics by source of uploads.

cussing what to pay attention to during BSE, and inclusion of the areola-nipple complex and the underarm in the examination. There was no significant difference between the upload source groups in relation to the comprehensiveness score obtained from this evaluation (Fig. 2) However, as the number of covered topics increased, there was a significant increase in the total video score (P<0.001) (Tables 2 and 3).

There was a negative correlation between the total video score and video length (r=-0.225, p = 0.005), number of daily views (r=-0.163, P=0.042), and the VPI (r = -0.163, P=0.042). In addition, the total video score had a positive and significant relationship with the time since upload (r=0.167, P=0.037) and the comprehensiveness score (r=0.422, P<0.001). However, no significant correlation was found between the total video score and total views (r=-0.082, P=0.307) (Table 3).

Spearman's rho correlation test was applied. Statistical significance was demonstrated using the P-value. P<0.05 was considered statistically significant and marked in bold (r: correlation coefficient)

DISCUSSION

The internet is a widely used tool for obtaining information about healthcare. YouTube has a huge amount of data on healthcare. Some of the information presented on this platform is misleading or inaccurate. Considering that YouTube is one of the most accessed

websites across the world, it is clear that such misleading information can easily spread and have unfavorable consequences. To prevent this, it is necessary to take steps to increase the quality of uploaded videos and ensure their quality control. In the literature, there are many studies investigating the quality of YouTube videos on medical issues [15-20].

This study evaluated whether the Turkish-titled videos searched with the keyword "breast self-examination" on YouTube complied with the relevant guidelines, provided accurate information, and were educationally useful or misleading. Of the videos that emerged from this search, 74.3% were included in the sample, and 25.7% were excluded. In similar previous studies, the rate of exclusion ranged from 80 to 90% [27, 28]. This shows that although searches are made using related keywords, the content of the videos displayed may be irrelevant to the subject. This may be due to uploads with the purpose of advertising a product or service and attempts to increase the number of views. In the current study, the rate of exclusion was lower than reported in the literature, probably because the search was limited to Turkish-titled videos.

In the literature, different rates of usefulness have been reported concerning YouTube videos on different subjects. For example, the rate of useful videos was found to be over 60% for those with spondylarthritis [29], 62% for those with lung cancer [30], 65.4% for those with asthma [31], and 22% for those on endoscopic transsphenoidal surgery [32]. In addition, Esen

Table 2. Comparison of all parameters between the upload source groups

Characteristics		All videos (n=156)	Universities/professional organizations/non-profit physicians/physicians (n=32)	Stand-alone health information websites (n=25)	Medical advertisement/for-profit companies (n=53)	Individual users (n=46)	P value
Total views		256 (59-2,680)	150 (30-695)	156 (38-3,310)	507 (77-5,569)	298 (95-1,069)	0.233
Video length, second		164 (110-357)	175 (114-686)	163 (111-404)	146 (93-335)	167 (128-290)	0.282
Time since upload (month)		24 (12-52)	21 (12-48)	27 (15-76)	28 (12-52)	16 (9-52)	0.599
Views per day		0.49 (0.12-2.49)	0.34 (0.07-1.04)	0.53 (0.07-2.17)	0.77 (0.18-5.63)	0.51 (0.23-2.33)	0.143
Video power index (VPI)		0.49 (0.12-2.49)	0.34 (0.07-1.04)	0.53 (0.07-2.17)	0.77 (0.18-5.63)	0.51 (0.23-2.33)	0.143
Comprehensiveness score		50 (25-75)	50.0 (6.25-75)	50.00 (25.00-87.50)	50 (25.00-87.50)	37.50 (25.00-75.00)	0.515
Total video scores		4 (5.5-8)	5 (4-6)	7 (4-11)	6 (4-7)	5 (4-12)	0.442
Speaker gender, n (%)	Man	76 (48.7%)	19 (59.4%)	13 (52.0%)	25 (47.2%)	19 (41.3%)	0.357
	Woman	68 (43.6%)	13 (40.6%)	9 (36.0%)	22 (41.5%)	24 (52.2%)	
	No speaker	12 (7.7%)	0 (0.0%)	3 (12.0%)	6 (11.3%)	3 (6.5%)	
Usefulness, n (%)	Misleading information	133 (85.3%)	31 (96.9%)[a]	19 (76.0%)[b]	48 (90.6%)[a,b]	35 (76.1%)[b]	**0.024**
	Useful information	23 (14.7%)	1 (3.1%)[a]	6 (24.0%)[b]	5 (9.4%)[a,b]	11 (23.9%)[b]	

Table 3. The relationship between total video score and video characteristics

Characteristic	Total Video Scores	
	R value	P value
Total views	-0.082	0.307
Video length, second	-0.225	**0.005**
Time since upload (month)	0.167	**0.037**
Views per day	-0.163	**0.042**
Video Power Index	-0.163	**0.042**
Comprehensiveness score	0.422	**<0.001**

Spearman's rho correlation test was applied. Statistical significance was demonstrated using the P-value. P<0.05 was considered statistically significant and marked in bold (r: correlation coefficient)

et al. [26] reported the rate of useful videos to be[26]. In our study, this rate was determined to be lower, at approximately 14.7%. According to this result, it can be suggested that the educational quality of BSE videos with Turkish titles on YouTube is very inadequate.

When the distribution of upload sources was examined, 20.5% of the videos had been uploaded by universities/professional organizations/non-profit physicians/physicians, 16.02% by stand-alone health information websites, 33.4% by medical advertisement/for-profit companies, and 29.5% by individual users. In previous studies, the rate of healthcare professionals among video uploaders was reported to be 69% for spondylarthritis videos [29] and 7.7% for asthma videos [31]. Therefore, this rate seems to vary according to the subject of the videos examined in the literature.

Elangovan et al. [29] reported that 96% of useful videos had been uploaded by healthcare professionals. The authors also found that 83% of misleading videos had been uploaded by healthcare professionals. In a study on laryngeal cancer, Enver et al. [33] emphasized that videos uploaded by universities were more useful. Diers et al. [31] determined that a small portion (7.7%) of asthma-related videos had been uploaded by healthcare professionals, but they were more useful than those from other uploaders. Thus, there is no consensus in the literature on this issue. While the videos that were found to be useful in our study had been mostly uploaded by independent health information

websites, misleading videos had been mostly uploaded by universities/professional organizations/non-profit physicians/physicians. This supports the data of some of the studies in the literature, revealing that even if some uploaders are healthcare professionals, there is a need for more useful videos with better quality.

Diers et al. [31] reported that the videos of uploaders other than healthcare professionals were more popular. Meteran et al. [30] determined that misleading videos were more popular (30). In contrast, in our study, there was no significant difference between the upload source groups in terms of total views, video length, time since upload, daily views, VPI, comprehensiveness score, or total video score.

In this study, we determined that the total views, daily views, VPI, and comprehensiveness scores of videos classified as useful according to Azer's criteria were higher when compared to those of misleading videos. This result shows that useful videos attract more attention from viewers. In our study, total views did not have a correlation with the total video score. However, as the time since the video upload and the comprehensiveness score increased, the total video score also increased. In addition, there was a negative relationship between the total video score video length, and daily views.

Limitations

Among the limitations of this study are that videos uploaded to platforms other than YouTube were not evaluated, and videos that were not in Turkish were excluded. Another limitation is that the total video score was calculated subjectively.

CONCLUSION

Based on the results of this research, it is not easy to directly access educational videos about BSE on YouTube. The number of useful Turkish videos about BSE was found to be very low. While we expected to see that the videos uploaded by healthcare professionals would have higher content quality and educational value, we did not observe this. There was no significant difference between the upload source groups in terms of the parameters examined. Therefore, we conclude that healthcare professionals using the YouTube platform should produce more educational and useful videos. We recommend that YouTube videos on BSE be prepared in accordance with the relevant guidelines by prioritizing educational and useful content and taking Azer's criteria into account to increase views and likes.

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