Quality, reliability, and content assessment of YouTube™ videos associated with aphasia

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ABSTRACT

Aims: Health-related videos on YouTube make it easy to share information on diseases and address a wide audience. However, there is doubt among specialists about their reliability, quality, and whether they contain correct information. The present study aimed to evaluate the quality of the information provided by searching for "aphasia" on YouTube™.

Methods: The results of the YouTube™ search were examined using the keywords "aphasia, Broca, Wernicke, conductive type, transcortical, anomic". A total of 100 videos were identified, containing at least one of the keywords, relevant to the context, having at least 1000 views, published after 2010, in the English language, and shorter than 60 minutes. Modified DISCERN, Global Quality Score (GQS), Video Information and Quality Index (VIQI), and the Journal of American Medical Association (JAMA), rating, viewer interaction, and meta data were used for evaluating the videos. The scores of the scales indicated by The Kruskal-Wallis H Test were compared between the groups according to the video source (news agency, healthcare personnel/specialist, other people). The data were analyzed with Dunn's Test as a post-hoc test. Relational analyses and Spearman's RHO Correlation were used for statistical analyzes. The significance level was taken as $p<0.05$

Results: A total of 59 videos were taken for assessment, 34% of the videos were uploaded by news agencies, 52.5% by healthcare institutions/specialists, and 13.5% by laypeople. Significant differences were detected between GQS scores ($\chi2=8.66$, $p=0.01$) and VIQI ($\chi2=9.87$, $p=0.00$) according to the video sources. Cohen Kappa scores indicating inter-observer agreement were 0.887. The average DISCERN score was 3.74, the VIQI score was 3.64 and GQS score was 3.67 and the JAMA score was 2.59.

Conclusion: The videos about aphasia on YouTube™ were determined to have moderate scores in terms of quality, information accuracy, and reliability. Videos uploaded by healthcare professionals/specialists have higher quality and information accuracy. Especially the news agencies with the highest ratings should be sensitive about publishing accurate information.

Keywords: Aphasia, online video, internet, health, YouTube™

INTRODUCTION

The internet and social media are a part of daily life in today's world. The spread of informative videos about health problems over the internet has become an important tool to increase health awareness in society.[1]

One of the most frequently used social media sites is YouTube™, which was created in 2005 and currently has more than one billion users and provides hundreds of millions of hours of total video watch time each day.[2] YouTube™ is the most popular video-sharing site on a worldwide scale and has over 1 billion hours of views each day with over 30 million medical videos.[3] It is used not only as video storage but also as a social network where users interact with their comments and like to build trust.[4] YouTube™ is also frequently used for health issues.

Online videos make it easy to share information on health issues, reach a wide audience, and can be beneficial in the diagnosis, prevention, and treatment of diseases and improving the quality of life.[5] Recently, some studies have investigated video information in communication disorders focusing on Autism Spectrum Disorder. Kollia et al.[6] and Bellon-Harn et al.[7] analyzed the videos on Autism Spectrum Disorder (ASD). However, no such study has been conducted for aphasia.

Aphasia is an acquired neurogenic language disorder affecting the functioning of the key elements of the language network in the brain, typically the left hemisphere. Varying degrees of impairment are seen in speech, written expression, comprehension, and reading comprehension in aphasia. It is estimated that approximately 100.000-180.000 people in the United States of America suffer from aphasia

each year.[8] Also, 2-4 million people live with aphasia in the United States.[9] Aphasia is most caused by stroke, but it can also be a result of Traumatic Brain Injuries (TBIs), brain tumors, infections, dementia, or other neurodegenerative diseases. Many YouTube™ channels post videos that offer information on aphasia. Among these, channels such as "National Aphasia Association", "The Aphasia Channel", "American Speech-Language-Hearing Association" health portals such as NHS Choices, Mayo Clinic, and PubMed use YouTube™ social media channels to distribute their content.[10] The videos on these channels were prepared by people who are specialists in aphasia. Madathil et al.[11] reported that videos from government agencies and professional organizations contain reliable and high-quality information.

Videos on aphasia contain information about its symptoms, causes, diagnosis, and treatment and help aphasia patients improve their communication skills. However, the videos on health problems must be supported with accurate information and resources. False or misleading information can cause serious risks to people's health.[9] For this reason, when choosing videos about health problems, one should be careful about the expertise of the authors, information sources of the videos, references, and the accuracy of their contents.[10,12] Investigating the information on YouTube™ to which wide audiences are exposed will help specialists to guide patients to useful, accurate, and accessible information.[13,14] Scales with standard parameters were used in previous studies investigating health-related videos published on YouTube™ to determine the reliability of the contents. The most common of these parameters are the Journal of American Medical Association (JAMA) Criteria, DISCERN, Global Quality Score (GQS), and Video Information and Quality Index (VIQI).

The present study aimed to evaluate the aphasia-related videos in 100 YouTube™ videos on aphasia and its types according to the Journal of American Medical Association (JAMA) Criteria, DISCERN, Global Quality Score (GQS) and Video Information and Quality Index (VIQI) and metadata (e.g. video length, number of views, number of likes and comments), rating, viewer interaction.

METHODS

No human participants or animals were included in the study. Publicly available YouTube videos were analyzed, and for that reason, ethical approval was not needed for other similar YouTube studies.[17,18]

Broca's Aphasia, Wernicke's Aphasia, conductive aphasia, transcortical aphasia, and anomic aphasia types of aphasia were indicated in previous studies.[15] For this study, 6 keywords were determined as "aphasia, Broca, Wernicke,

conductive type, transcortical, and anomic". In line with this, the YouTube™ Application Programming Interface (API) was used to search for videos containing queries on aphasia by using the 6 keywords specified on 11.03.2023. Browser history and cookies were cleared, and the Mozilla Firefox browser (Version 62.0.3) was used in private mode to minimize user-targeted search results.

Attention was paid to the fact that the videos were in English and did not have any subject other than aphasia, the upload date was in 2010 and later, and the number of views was 1000 or more. The total duration of the videos that contained the previously mentioned 6 keywords (n=100) was determined as 638 minutes. A total of 41 videos were excluded from the analyses. Video inclusion criteria were determined that it should be in English, be relevant to the title, not be a commercial video, and be no longer than 60 minutes. Two independent speech and language therapists reviewed 59 videos. Inter-observer agreement was evaluated with Cohen's Kappa Coefficient.

The content of each video was categorized and coded. The videos were grouped according to the source of the news agency, healthcare institution/specialist, and other people (e.g., patient relatives). Videos that met the inclusion criteria were analyzed for differences in reliability (DISCERN), quality (GQS), and accuracy of information (VIQI), Journal of American Medical Association (JAMA) criteria, rating, viewer interaction, and metadata, and the correlation between the specified parameters was tested (**Figure 1**).
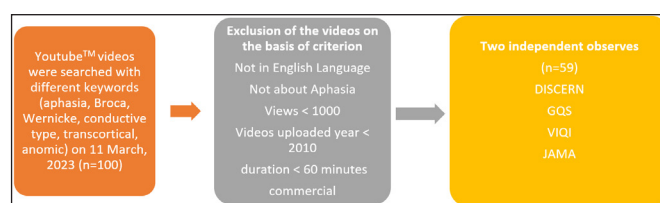

Figure 1. Flow chart of the screening procedure

Video reliability was evaluated by using DISCERN. The modified DISCERN score was used to evaluate clarity, reliability, bias, reference suffix, and areas of uncertainty for information in YouTube™ videos. Each question was scored "Yes" (1 point) or "No" (0 points) ("Are the aims clear and achieved?", "Are reliable sources of information used? (i.e., cited publication, the speaker is a board-certified vascular surgeon)", "Is the information balanced and unbiased?", "Are additional sources of information listed for patient reference?", and "Are areas of uncertainty mentioned?").

The Global Quality Scale (GQS) was used to measure the overall quality of the videos on a 5-point Likert scale (1: Poor, 5: High-Quality). Higher scores indicate better video quality. The items of GQS were: Poor quality, very unlikely to be of any use to patients, Poor quality

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but some information present, of very limited use to patients, Suboptimal flow, some information covered but important topics missing, somewhat useful to patients, good quality and flow, most important topics covered, useful to patients, excellent quality and flow, highly useful to patients. Information accuracy, information flow, and quality and precision of the videos were evaluated with the VIQI Scale. A 5-point Likert scale (1: Poor, 5: High-Quality) was used in evaluating the videos with VIQI.

The Journal of American Medical Association (JAMA), which is a system used to evaluate the reliability of health-related online resources, based on 4 criteria (authorship, citation, explanation, and up-to-date status) was used. JAMA criteria are Authorship, Attribution, Disclosure, and Currency and each criterion is graded as "0" or "1".

Finally, meta-data includes the number of views, the length of the videos, and the number of likes, dislikes, and comments. Viewer interaction and rating of the videos were also calculated. Viewer interaction was calculated as follows (Likes - dislikes / total views X 100). The rating was calculated by dividing the number of views by the number of days after uploading and multiplying by 100.[16]

Statistical Method

The statistical software SPSS 26.0 (SPSS Inc., Chicago, IL, USA) was used to analyze different characteristics of aphasia videos. Normal distribution was evaluated by using the Shapiro-Wilk Test. The Kruskal-Wallis H Test, reliability (DISCERN), quality (GQS) and information accuracy (VIQI), JAMA, viewer interaction, rating, and metadata were used to examine whether the videos differed by the video source (news agency, healthcare agency/specialist, and others). In case of significant differences were detected between the groups, Dunn's Test was preferred as the post-hoc test. The Spearman Correlation was performed to examine the correlation between the variables. Analysis results were presented as frequency (percentage) for categorical variables and the significance level was taken as p<0.05.

RESULTS

A total of 100 videos were analyzed and 41 were excluded because they did not meet the criteria (non-English languages (n=6), irrelevant to the title (n=4), videos with advertisements (n=6), videos longer than 60 minutes (n=9), and videos with no context, information, or description (n=16). Cohen Kappa scores indicating inter-observer agreement for DISCERN, GQS, JAMA, and VIQI scale scores were 0.822, 0.868, 0.816, and 0.887, respectively. According to the DISCERN scores, 10 of the 59 videos were assessed as excellent, 22 as good, 23 as fair, and 4 as poor. The average DISCERN score was 3.74±1.02 (**Figure 2**).
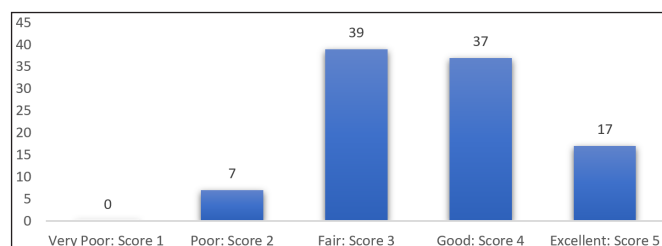

Figure 2. Distribution according to Modified DISCERN scores

JAMA scores (x̄=2.59, SD=0.81) were determined as GQS (x̄=3.67, SD=0.85), and DISCERN (x̄=3.74, SD=1.02). According to the VIQI scores (x̄=3.64, SD=0.84), 10 out of 59 videos were found as Scale 5 (high-quality), 22 as Scale 4, 23 as Scale 3, and 4 as Scale 2 (**Figure 3**).
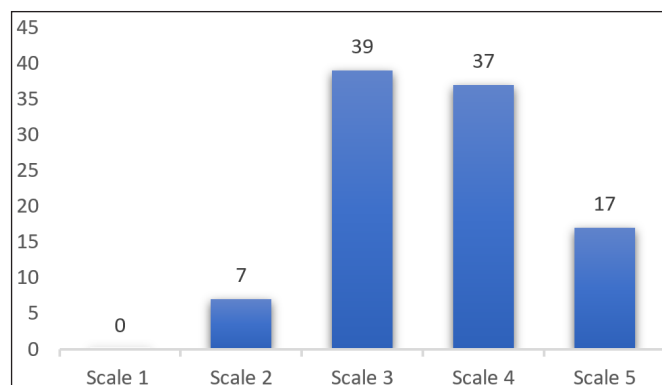

Figure 3. Distribution of videos according to VIQI scores

As seen in **Table 1**, relational analyzes were made according to the duration of the video, number of views, number of likes, number of comments, the Total DISCERN score, VIQI, GQS, JAMA, rating, and viewer interaction.

Table 1. Correlation between video characteristics and quantitative observations

	Number of views	Modified DISCERN	VIQI	GQS	JAMA
Video duration	-.083	-.053	.338**	.366**	.373**
Rating	.829**	.071	.062	.143	-.148
Viewer interaction	-.184	.107	.314*	.290*	.142
Number of likes	.688**	.000	.103	.180	-.182
Number of comments	.523**	-.051	-.067	.033	.004
Spearman's RHO correlation coefficient, (P <0.05), **Moderate positive correlation, *Weak positive correlation					

A total of 34% of the videos were uploaded by news agencies, 52.5% by healthcare institutions/specialists, and 13.5% by laypeople. Significant differences were detected between video source categorization and GQS (χ2 =8.66, df=2, p=0.01) and VIQI (χ2=9.87, df=2, p=0.00). The Dunn Post-Hoc Test was used for pairwise comparisons to determine from which groups the significant differences originated as a result of the analysis made with the Kruskal Wallis Test. It was determined that the VIQI scores in the news agency category differed significantly from the healthcare staff/specialist category (p=0.042). GQS scores were also found to differ significantly from

Table 2. Detailed characteristics of classified YouTube Aphasia videos						
	News Agency		**Healthcare Institution/Specialist**		**Others**	
	x̄	**SD**	**x̄**	**SD**	**x̄**	**SD**
Duration (sec.)	249.0588	64.89208	216.2000	33.80623	307.5000	66.41160
Number of likes	2242.7647	1694.76636	3471.9500	1676.28064	1325.1250	694.12950
Number of comments	97.2941	78.13999	291.3500	150.86296	190.5000	120.46828
Discern total	3.3750	.41993	4.3588	. 18131	3.5000	.25649
VIQI	3.4000	.15218	4.4088	.18131	3.1250	.35038
GQS	3.4500	.15347	4.1176	. 18947	3.1250	.35038
JAMA	2.5294	.17400	2.6000	.15218	2.1250	.29505
Rating	46619.0588	43970.495	23381.1000	11208.525	2346.7500	1033.29182
Viewer interaction	1.0865	.28090	1.1995	.22698	.6725	.18433
x̄: mean, SD: Standard Deviation						

the healthcare staff/specialist category according to the news agency category (p=0.050).

The video durations, the number of likes and comments, ratings, viewer interaction scores, and average and standard deviations of the DISCERN, JAMA, VIQI, and GQS scale scores of the groups that were categorized according to the source of the video are given in **Table 2**.

DISCUSSION

Aphasia-related 59 videos were analyzed for reliability (DISCERN), quality (GQS) and information accuracy (VIQI), JAMA, viewer interaction, viewership, and metadata. In the literature, there is no consensus on which of these scales is more precise.[19] For this reason, it was desired to make a more objective assessment by using different scales together. When the correlation analyzes were examined, a highly positive and significant correlation was detected between GQS, DISCERN, and VIQI scores (p=0.00). Considering this finding, it can be thought that the videos that were analyzed with the scales can reach more consistent and reliable results.

The 59 analyzed videos on aphasia were rated as quality on the reliability scale (DISCERN). The question "Is the information presented balanced and unbiased?" had the highest average score among the DISCERN items (x̄=0.94). In terms of information accuracy and flow, quality, and precision (VIQI), Scale 3 (39%) was evaluated as fair and Scale 4 (37%) as good. In terms of general quality (GQS), there was a good flow in the total of the videos examined about aphasia and it is considered to be beneficial for patients. In the present study, JAMA scores (x̄=2.59, SD=0.81), GQS (x̄=3.67, SD=0.85), DISCERN (x̄=3.74, SD=1.02), and VIQI (x̄=3.64, SD=0.84) scale scores were found to be lower according to scales evolution criterias (1: Poor, 5: High-Quality). It is considered that the videos to be added to YouTube™ about aphasia should increase their credibility in terms of authorship, attribution, explanation, and up-to-date status.

In the present study, it was analyzed whether there were significant differences between the scale scores according to the source of the videos. As a result of these analyses, GQS and VIQI scores showed significant differences between the groups. The GQS and VIQI scores of YouTube™ videos uploaded by healthcare institutions/specialists were statistically and significantly higher than the scores of videos uploaded by news agencies. Madathil et al.[11] reported that videos uploaded by government agencies and professional organizations contained reliable and high-quality information. The finding of the present study supports the study of Madathil et al.

News agencies had significantly lower quality and information accuracy among the three groups. However, it was found that the most watched rate among all groups was in the videos of news agencies. There may be two different reasons for this high rating. The first of these was that the famous actor Bruce Willis was diagnosed with neurodegenerative aphasia due to frontotemporal dementia (FTD) featured in the video titles. Famous people are often used in advertising and media management to attract the attention of social media users.[20] After this world-renowned famous actor was diagnosed with aphasia, aphasia may have been on the agenda more than ever, and for this reason, the rating may be high. Another important factor was that the news agencies that uploaded the videos were international news channels. The high number of subscribers and their international recognition (e.g., BBC News) may have resulted in high ratings. Since the videos uploaded by news channels have high viewership rates, it is recommended that these videos receive support from governmental organizations, associations, educational institutions, and health professionals on aphasia before they are published. In this way, it is thought that they will be more beneficial to aphasia patients.

Considering the viewer interaction scores, the category with the highest interaction rate was healthcare staff/specialists. Similar to the findings of Bilir and Yılancı,[21] in which they analyzed videos about "bruxism", the interaction of specialist videos resulted in more

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interaction by viewers than all video sources. One of the reasons this finding was reached may be that the video duration was shorter than the other groups (approximately 3 minutes). The shortness of the duration can be associated with the fact that people who watched the video until the end gave feedback at the end of the video (number of likes: 3471.9500). Compared to other groups, the number of comments in the category of healthcare staff/specialist was also higher (number of likes=291.3500). Topps et al.[22] investigated the relationship between the duration of the videos and attention, participation and comment, stated that the duration of the videos is 5 minutes or more was associated with lower attention and participation scores.

In terms of health-related videos, videos on aphasia are in threat because there are no rules or restrictions on uploading videos, and everyone can easily shoot and upload videos. It was found that the videos on "aphasia" against this threat were mostly uploaded by healthcare staff/specialists (52.5%). This finding shows that there are relatively reliable, accurate, quality videos on YouTube™, at least for aphasia.

One of the limitations of the present study was that it had a cross-sectional design and included videos only in English. In future studies, a comprehensive analysis can be made in different languages by adding other social media platforms. The information acquired from these studies can help people who upload health-related videos to be informed and benefit from this information while producing content. In this way, it will support the public to obtain relatively more useful health information.

CONCLUSION

YouTube™ is a platform where new videos are constantly added and the number of viewers continues to increase. Producing content to increase the quality and accuracy of the information on aphasia videos added to YouTube™, which has the potential to affect large audiences, will increase the benefit of patients in this regard.

ETHICAL DECLARATIONS

Ethics Committee Approval: Ethics committee approval was not obtained as there was no human or animal participation in the study, and the videos were public. Study according to the World Medical Association Declaration of Helsinki, as no patient data or materials were used and all videos used for the study are available on a public social media website (YouTube™).

Informed Consent: There was no human or animal participation in the study and the videos reviewed on YouTube™ were open to everyone. For this reason, it was not necessary to obtain informed consent.

Referee Evaluation Process: Externally peer reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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