ORIGINAL RESEARCH / *ÖZGÜN ARAŞTIRMA*

Content analysis of Youtube videos related to brain death

Beyin ölümü ile ilgili Youtube videolarının içerik analizi

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ABSTRACT

Introduction: This study aimed to evaluate the quality of information content in YouTube videos related to brain death.

Methods: A search was conducted on the YouTube video platform using the keywords "brain death" and "brain death and organ donation" on November 20, 2024. A total of 42 videos were included in the evaluation. Data regarding the number of views, likes, comments, video duration, the number of days since the video was uploaded, and the source of the video were recorded. To classify the quality of the video content, DISCERN (Quality Criteria for Consumer Health), GQS (Global Quality Scale) for evaluating educational content, JAMA (Journal of the American Medical Association) for assessing the accuracy of the video source, and USEFULNESS for determining the utility of the videos were used.

Results: Among the analyzed videos, 25 (59.52%) were uploaded by physicians. Sixteen videos (38.10%) were rated as having very low educational quality, 13 (30.95%) provided partially sufficient information about the video source, 16 (38.10%) were of low information quality, and 13 (30.95%) were found to be of low usefulness. The quality scores of videos uploaded by physicians were significantly higher compared to other groups.

Discussion and Conclusion: The quality and educational value of YouTube videos related to brain death are low. Therefore, it is crucial that videos accessed through YouTube and other social media platforms are supervised by experts in the field to ensure accurate and useful information.

Keywords: brain death, organ donation, YouTube

ÖZ

Giriş ve Amaç: Bu çalışma, beyin ölümü ile ilgili YouTube videolarındaki bilgi içeriğinin kalitesini değerlendirmeyi amaçlamıştır.

Yöntem ve Gereçler: 20 Kasım 2024 tarihinde YouTube platformunda "beyin ölümü" ve "beyin ölümü ve organ bağışı" anahtar kelimeleri kullanılarak bir arama yapılmıştır. Değerlendirme için toplamda 42 video dahil edilmiştir. Videoların izlenme sayısı, beğeni sayısı, yorum sayısı, video süresi, yüklenme tarihinden itibaren geçen gün sayısı ve video kaynağına ilişkin veriler kaydedilmiştir. Video içeriğinin kalitesini sınıflandırmak için DISCERN (Quality Criteria for Consumer Health), GQS (Global Quality Scale) eğitimsel içeriği değerlendirmek için, JAMA (Journal of the American Medical Association) video kaynağının doğruluğunu değerlendirmek için ve USEFULNESS videoların faydasını belirlemek için kullanılmıştır.

Bulgular: Analiz edilen videoların 25'i (%59,52) doktorlar tarafından yüklenmiştir. On altı video (%38,10) çok düşük eğitimsel kaliteye sahip olarak derecelendirilmiş, 13 video (%30,95) video kaynağı hakkında kısmen yeterli bilgi sağlamış, 16 video (%38,10) düşük bilgi kalitesine sahip bulunmuş ve 13 video (%30,95) düşük fayda düzeyinde değerlendirilmiştir. Doktorlar tarafından yüklenen videoların kalite puanları, diğer gruplara kıyasla önemli ölçüde daha yüksek bulunmuştur.

Tartışma ve Sonuç: Beyin ölümü ile ilgili YouTube videolarının kalite ve eğitimsel değeri düşüktür. Bu nedenle, YouTube ve diğer sosyal medya platformlarından erişilen videoların doğru ve faydalı bilgi sağlanmasını garanti altına almak için alan uzmanları tarafından denetlenmesi kritik önem taşımaktadır.

Anahtar Kelimeler: beyin ölümü, organ bağışı, YouTube

Introduction

The internet has become one of the most frequently used sources of information today due to its accessibility to a large portion of the global population and its diverse range of informational content (1). Approximately five billion people worldwide are active internet users (2). It is well-known that people regard the internet as a significant source of health information and often research their health conditions online before seeking care from healthcare institutions (3). The rapid, easy, and low-cost access to medical information online is among the primary reasons for this trend (4). According to data from the Turkish Statistical Institute (TÜİK) in 2021, 92.0% of households in Turkey had internet access, and 82.6% of individuals aged 16-74 used the internet. The rate of searching for health-related information was reported as 69.6% (5). It has been noted that internet usage in Turkey, especially for following health-related news, is remarkably high (6).

YouTube is a widely used and easily accessible website and video-sharing platform globally (7). The widespread use of YouTube has made it an important source for accessing health-related information for patients (8). However, due to the lack of a pre-upload evaluation mechanism, it can both provide benefits to users and lead to the dissemination of misleading information (9).

In the literature, there is no study analysing the videos available on the YouTube platform concerning brain death, a topic that is highly debated and requires accurate information. Therefore, this study aims to evaluate the quality and accuracy of the information content in videos related to brain death available on YouTube.

Methods

Search strategy

On November 20, 2024, a search was conducted on YouTube (Alphabet Inc., Mountain View, CA, USA)

using the terms "brain death" and "brain death and organ donation." A total of 100 videos were initially reviewed. The exclusion criteria for this study included videos in languages other than Turkish, those with irrelevant content, videos longer than 30 minutes, duplicates, and videos with poor audio or visual quality that hindered proper evaluation.

Based on these criteria, 58 videos were excluded: 8 due to duplication, 12 because they exceeded 30 minutes in duration, 18 for being news content from newspapers or television, and 20 for containing irrelevant content. As a result, 42 videos were included for analysis (Figure 1).

The video analysis was conducted independently and simultaneously by two separate researchers.

Video evaluation

For each video, the number of views, duration, and total likes were recorded. Various tools were utilized to assess video quality: DISCERN Score: DISCERN, an effective method for evaluating the quality of health information on the internet, was employed (10). This tool consists of 12 items, assessing the reliability, quality, adequacy, and overall evaluation of the information provided about brain death. Each item was scored from 1 to 5, and a total DISCERN score was calculated. Scores were classified as follows: 51–60: Excellent, 41–50: Good, 31–40: Moderate, 21–30: Poor, 11–20: Very poor (11).
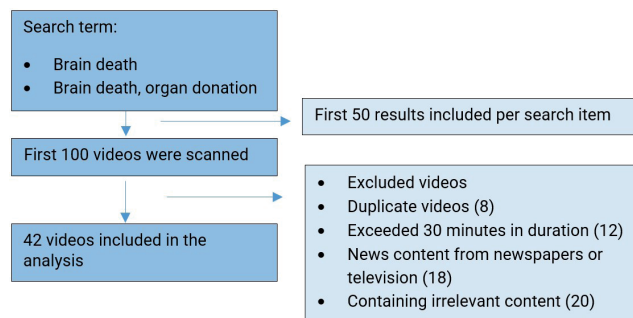
Figure 1. Selection methodology of YouTube videos

Journal of the American Medical Association (JAMA) Criteria: This scoring system includes four criteria—authorship, citation, disclosure, and currency. Videos were rated as follows: 1 point: Insufficient data on the source, 2–3 points: Partially sufficient data on the source, 4 points: Fully sufficient data on the source (12).

Global Quality Scale (GQS): GQS evaluates the educational value of videos, scoring them as: 1: Poor quality, 2: Poor quality but contains limited information for patient use, 3: Moderate quality, some information present but lacks essential details for patients, 4: Good quality, provides useful information for patients, 5: Excellent quality, highly useful for patients (13).

USEFULNESS Score: Videos were assessed for their usefulness to the target audience: 0: Not useful, 1–3: Minimally useful, 4–7: Useful, 8–10: Very useful (14).

Engagement Index= (Likes−Dislikes)/Views×100 (15).

Total interaction=(Likes−Dislikes)+Comments (15).

Videos were categorized based on their sources, being classified as uploaded by physicians or non-physicians.

Statistical analysis

The Statistical Package for Social Science for Windows (SPSS) version 23.0 was used for the analysis of the data obtained in the study. Descriptive statistics, including frequency and percentage distribution analysis, minimum-maximum values, mean, and standard deviation, were employed to summarise the data. Kappa analysis was utilised to determine the inter-rater reliability among experts evaluating the YouTube videos.

The normality of the data distribution, both overall and within groups, was tested using the Shapiro–Wilk test. For the comparison of scores obtained in the study, the Kruskal–Wallis test was used when the data did not follow a normal distribution to evaluate differences between groups. In cases where significant differences were identified between groups, the Bonferroni-adjusted Mann–Whitney U test was applied.

To examine the relationships between variables, Spearman's rank correlation (rho) analysis was conducted. Results were considered statistically significant at a 95% confidence level ($p < 0.05$).

Ethical approval

As the videos analyzed in this study were publicly accessible and the analysis did not include any information about video titles or the personal details of the creators, and no human or animal subjects were involved, ethical approval was not required.

Results

The inter-rater reliability among experts evaluating YouTube videos was determined using Kappa analysis. The results indicated excellent agreement across all evaluations: DISCERN (Kappa = 0.976), JAMA (Kappa = 0.961), USEFULNESS (Kappa = 0.958), and GQS (Kappa = 0.967).

A total of 42 videos were analyzed. Of these, 25 (59.52%) were uploaded by physicians, while 17 (40.48%) were uploaded by non-physicians. The total number of views across all videos was 464,047. The most-viewed video had 95,732 views, and the most-liked video received 1,000 likes.

The DISCERN score was used to assess educational quality. The results revealed that:16 videos (32.10%) were of very low quality, 9 videos (21.43%) were of good or excellent quality. Regarding the accuracy and reliability of the video source as evaluated by the JAMA criteria: 29 videos (69.05%) had insufficient data about the video source, 8 videos (19.05%) had fully sufficient data. Based on the USEFULNESS scoring system: 17 videos (40.48%) were not useful, 9 videos (21.42%) were highly useful. GQS, used to

determine educational value, indicated that: 16 videos (38.10%) were of poor quality, 7 videos (16.67%) were of excellent quality (Table 1).

The average DISCERN score was determined to be 28.81 ± 15.87 (median: 23; min-max: 12–60), while the mean JAMA score was 2.05 ± 1.04 (median: 2; min-max: 0.00–4). The average USEFULNESS score was 3.23 ± 3.64 (median: 2; min-max: 0.00–10), and the mean GQS score was 2.33 ± 1.46 (median: 2; min-max: 1–5) (Table 1).

According to Table 2, the average time elapsed since the upload of the analysed videos was 1857 ± 1197.83 days (median: 1927.50; min-max: 32–4546). The average duration of the videos was 4.95 ± 7.35 minutes (median: 2.01; min-max: 0.51–22.50). The mean number of likes was 127.10 ± 208.87 (median: 28.50; min-max: 0–1000), and the mean number of comments was 13.98 ± 43.45 (median: 0; min-max: 0–231). The average number of views was 5468.50 ± 11743 (median: 2160; min-max: 101–56140), while the mean total interaction was 138.71 ± 223.82 (median:

Table 1. Evaluation of video quality

Variables		Frequency	%
SOURCE	Physician	25	59,52
	Non-physicians	17	40,48
DISCERN Score 28.81 ± 15.87 23 (12-60)	Very poor	16	38,10
	Poor	13	30,95
	Moderate	6	14,29
	Good	1	2,38
	Excellent	8	19,05
GQS 2.33 ± 1.46 2 (1-5)	Poor quality	16	38,10
	Poor quality, limited information	11	26,19
	Moderate quality, partially useful information	6	14,29
	Good quality, provides useful information	2	4,76
	Excellent quality, highly useful information	7	16,67
JAMA Score 2,05 ± 1,04 2(0.00-4)	Insufficient data regarding video source	29	69,05
	Partially sufficient data regarding video source	5	11,90
	Completely sufficient data regarding video source	8	19,05
USEFULNESS 3,23 ± 3,64 2 (0,00-10)	Not useful	17	40,48
	Minimally useful	13	30,95
	Useful	3	7,14
	Very useful	9	21,42
	Total	42	100

Table 2. Evaluation of the reviewed videos

	Mean	Standard deviation	Median	Minimum	Maximum
Days elapsed since upload	1857	1197.83	1927.50	32	4546
Video duration (sec)	4.95	7.35	2.01	0.51	22.50
Total likes	127.10	208.87	28.50	0	1000
Total comments	13.98	43.45	0	0	231
Total views	5468.50	11743	2160	101	56140
Total interaction	138.71	223.82	49.50	1	1000
Engagement index	1.47	1.32	1.35	0.04	6.33

49.50; min-max: 1–1000). The average engagement index was determined to be 1.47 ± 1.32 (median: 1.35; min-max: 0.04–6.33).

When comparing the scores across video uploaders, significant differences were observed in DISCERN (p = 0.00017), JAMA (p = 0.00018), GQS (p = 0.00095), and USEFULNESS (p = 0.00022) scores. In all cases where differences were identified, the average scores of videos uploaded by the physician group were significantly higher than those uploaded by the non-physician group (Table 3). The higher scores of videos uploaded by physicians may be attributed to the content of these videos being more grounded in academic knowledge.

When examining the correlations between the scores, a moderate positive correlation was found between the number of views and DISCERN (rho = 0.487), a moderately high positive correlation with GQS (rho = 0.547), a moderate positive correlation with JAMA (rho = 0.465), and a moderate positive correlation with USEFULNESS (rho = 0.393). The positive correlation between the number of views and quality measurements suggests that the audience tends to prefer higher-quality videos. Additionally, a moderate positive correlation was observed between video duration and DISCERN (rho = 0.396), while weak positive correlations were found with GQS (rho =

0.346), JAMA (rho = 0.340), and USEFULNESS (rho = 0.345) (Table 4).

Discussion

YouTube is the second most visited website after Google (16). Its accessibility and free usage have made it a vital source of information. Since YouTube is open to all users, anyone with an account can upload videos on any topic. Health-related videos are not only uploaded by physicians but also by hospitals, medical students, healthcare companies, non-physician healthcare professionals, and patients. As a result, YouTube hosts both accurate and misleading health information (17). Patients watch videos to learn about their health conditions and also share videos describing their own experiences (18).

There are numerous studies in the literature evaluating the quality of health-related YouTube videos (19). This study evaluated YouTube videos providing information about brain death. Of the videos analyzed, 59.52% were uploaded by physicians, while the remaining were predominantly shared by individuals providing religious commentary. According to DISCERN scores, the educational quality of videos on brain death was found to be moderate. Despite the fact that most of the speakers were physicians, the low average

Table 3. Comparison of video uploaders and their scores

Variables	Physician	Non-physicians	p
DISCERN score	35.75 ± 15.77 32 (14-60)	18.89 ±10.49 14.5 (12-51)	0.00017*
GQS	2.96 ± 1.37 2.5 (1-5)	1.39 ±1.02 1 (1-5)	0.00095*
JAMA score	2.26 ± 0.60 2 (1-4)	1.43 ± 1.29 2 (0-4)	0.00018*
USEFULNESS	4.62 ± 3.51 4 (1-4)	2.34 ± 3.76 0 (0-10)	0.00022*
Total interaction	118.33 ± 226.90 27.5 (1-1000)	170.28 ± 252.37 60 (1-840)	0.222
Engagement index	1.10 ± 0.97 0.69 (0.04-3.55)	1.76 ± 1.35 1.80 (0.08-6.33)	0.0533

* Mann-Whitney U Test, p-value < 0.05

Table 4. Correlation comparisons among scores

Variables	DISCERN	GQS	JAMA	USEFULNESS
Total views	0.487	0.547	0.465	0.393
	*0.001	***0.0001**	***0.001**	***0.010**
Days elapsed since upload	0.057	0.158	0.245	0.246
	0.721	0.315	0.173	0.170
Total likes	0.029	0.215	0.220	0.234
	0.852	0.170	0.160	0.150
Total comments	0.091	0.243	0.220	0.235
	0.562	0.120	0.160	0.140
Video duration (sec)	0.396	0.346	0.340	0.345
	*0.010	***0.025**	***0.035**	***0.030**
Engagement index	0.043	0.213	0.215	0.222
	0.782	0.174	0.170	0.150
Total interaction	0.114	0.078	0.098	0.110
	0.473	0.625	0.564	0.487

P-value; *rho = Spearman's correlation coefficient, significant at the 0.01 significance level.

DISCERN score is notable. This may be attributed to insufficient explanation of brain death diagnostic criteria and inadequate coverage of organ donation. However, all quality scoring metrics were higher for videos uploaded by physicians.

No correlation was found between daily views or likes and DISCERN, GQS, JAMA, or USEFULNESS scores. This suggests that video quality cannot be determined by the number of likes or views. Some studies indicate that the use of animations or visual effects in videos increases likes and views, regardless of content quality (20).

A weak positive correlation was identified between video duration and quality scores, likely due to longer videos providing more detailed explanations. Comment counts were not correlated with video quality, which may be because some high-quality videos do not allow comments, or because captivating speakers in videos with misleading information still attract significant comments. Furthermore, since YouTube has removed the visibility of total dislike counts, these are not reflected in total interaction scores.

Brain death and vegetative state are often confused concepts. This confusion leads families of patients with brain death to avoid organ donation, holding onto hope that the patient may recover. The biggest barrier to organ donation is the public's lack of adequate or accurate information. Educating and raising awareness about the difference between brain death and vegetative state is crucial to increasing organ donation rates. Another major barrier to organ donation is religious concerns (21). In countries like Turkey, where the majority of the population is Muslim, religious considerations play a significant role. Among the videos analyzed, only 4.76% emphasized that "the decision of the medical professional is reliable and valid," while 35.72% claimed that "brain death is not real, and organ donation is equivalent to murder as long as the heart is beating." However, Islamic teachings permit life-saving treatments, including organ transplantation. The Directorate of Religious Affairs in Turkey declared organ transplantation permissible in Islam through its 1980 decision No. 396 (22).

This study analyzed only the top 50 most relevant videos for each search term on a fixed date. YouTube content is dynamic, with new videos being uploaded

every minute. Different results may emerge with newly added videos. Increasing organ donation requires providing accurate information, as knowledge is one of the most improvable factors in this area (23). Factors influencing organ donation decisions should be identified, and healthcare education programs should be organized to enhance organ donation rates (24). These programs should be tailored to the cultural structure, religious beliefs, and knowledge level of the community and should be planned in a clear and comprehensible manner (25). Sharing stories of individuals who have continued their lives through organ transplantation may also be beneficial (26). Physicians, religious leaders, celebrities, and politicians, who significantly influence societal behaviours, should use social media to disseminate accurate information to broader audiences. Proper communication of the concept of brain death is expected to increase the number of organ donors (27).

Conclusion

Health-related content on YouTube and other social media platforms should be monitored by experts to ensure the dissemination of accurate and reliable information. Existing YouTube content on brain death is inadequate. Preparing and uploading higher-quality, informative, and visually appealing videos on this subject could be beneficial.

Ethical approval

As the videos analyzed in this study were publicly accessible and the analysis did not include any information about video titles or the personal details of the creators, and no human or animal subjects were involved, ethical approval was not required.

Author contribution

Study conception and design: SFÖ; data collection: SŞK, OKB; analysis and interpretation of results: SŞK, OKB; draft manuscript preparation: SŞK, SFÖ. The author(s) reviewed the results and approved the final version of the article.

Source of funding

Conflict of interest

The authors declare that there is no conflict of interest.

References

1. Korkmaz YN, Buyuk SK. YouTube as a patient-information source for cleft lip and palate. Cleft Palate Craniofac J. 2020;57:327-32. **[Crossref]**

2. World Internet Users Statistics and 2012 World Population Stats. Available at: https://www.scribd.com/document/167816789/World-Internet-Users-Statistics-Usage-and-World-Population-Stats (Accessed on Aug 26, 2025).

3. McMullan M. Patients using the Internet to obtain health information: how this affects the patient-health professional relationship. Patient Educ Couns. 2006;63:24-8. **[Crossref]**

4. Finney Rutten LJ, Blake KD, Greenberg-Worisek AJ, et al. Online health information seeking among US adults: measuring progress toward a healthy people 2020 objective. Public Health Rep. 2019;134:617-25. **[Crossref]**

5. Turkish Statistical Institute. Hanehalkı Bilişim Teknolojileri (BT) Kullanım Araştırması, 2021. Available at: https://data.tuik.gov.tr/Bulten/Index?p=Hanehalki-Bilisim-Teknolojileri-(BT)-Kullanim-Arastirmasi-2021-37437 (Accessed on Sep 7, 2021).

6. Baydili İ. Comparison of doctor videos on YouTube with Who and Turkish Ministry of Health Discourses during Covid-19 [Covid-19 sürecinde YouTube'daki doktor videolarının WHO ve Türkiye Cumhuriyeti Sağlık Bakanlığı söylemleri ile karşılaştırılması]. Journal of Turkish Studies. 2020;15:153-78. **[Crossref]**

7. Smith PE, McGuire J, Falci M, et al. Analysis of YouTube as a source of information for diabetic foot care. J Am Podiatr Med Assoc. 2019;109:122-6. **[Crossref]**

8. Duman ZM, Timur B, Bayram M. YouTube as a source of patient information on deep vein thrombosis. Turk J Vasc Surg. 2022;31:103-7. **[Crossref]**

9. Hegarty E, Campbell C, Grammatopoulos E, et al. YouTube™ as an information resource for orthognathic surgery. J Orthod. 2017;44:90-6. **[Crossref]**

10. Charnock D, Shepperd S, Needham G, Gann R. DISCERN: an instrument for judging the quality of written consumer health information on treatment choices. J Epidemiol Community Health. 1999;53:105-11. **[Crossref]**

11. Rees CE, Ford JE, Sheard CE. Evaluating the reliability of DISCERN: a tool for assessing the quality of written patient information on treatment choices. Patient Educ Couns. 2002;47:273-5. **[Crossref]**

12. Silberg WM, Lundberg GD, Musacchio RA. Assessing, controlling, and assuring the quality of medical information on the Internet: caveat lector et viewor-Let the reader and viewer beware. JAMA. 1997;277:1244-5. **[Crossref]**

13. Bernard A, Langille M, Hughes S, et al. A systematic review of patient inflammatory bowel disease information resources on the world wide web. Am J Gastroenterol. 2007;102:2070-7. **[Crossref]**

14. Lee JS, Seo HS, Hong TH. YouTube as a source of patient information on gallstone disease. World J Gastroenterol. 2014;20:4066-70. **[Crossref]**

15. Liikkanen LA. Three metrics for measuring user engagement with online media and a YouTube case study. arXiv preprint 2013;arXiv:1312.5547. **[Crossref]**

16. Wikipedia contributors. List of most-visited websites. Wikipedia. 2025. Available from: https://en.wikipedia.org/wiki/List_of_most-visited_websites [accessed 10 Aug 2025].

17. Wantland DJ, Portillo CJ, Holzemer WL, Slaughter R, McGhee EM. The effectiveness of web-based vs. non-web-based interventions: a meta-analysis of behavioral change outcomes. J Med Internet Res. 2004;6:e40. **[Crossref]**

18. Diaz JA, Griffith RA, Ng JJ, et al. Patients' use of the Internet for medical information. J Gen Intern Med. 2002;17:180-5. **[Crossref]**

19. Szmuda T, Ali S, Kamieniecki A, et al. YouTube as a source of patient information on brain aneurysms: a content-quality and audience engagement analysis. Neurol Neurochir Pol. 2021;55:485-93. **[Crossref]**

20. Heathcote LC, Pate JW, Park AL, et al. Pain neuroscience education on YouTube. PeerJ. 2019;7:e6603. **[Crossref]**

21. Özbolat A. "Organlarımla dirilmek istiyorum": Organ bağışının dini-toplumsal arka planı. Çukurova Üniversitesi İlahiyat Fakültesi Dergisi. 2017;17:61-87. **[Crossref]**

22. İslam Ansiklopedisi. Organ Nakli. Diyanet İşleri Başkanlığı Yayınları. Available from: https://islamansiklopedisi.org.tr/organ-nakli [accessed 2025].

23. Yilmaz TU. Importance of education in organ donation. Exp Clin Transplant. 2011;9(6):370-375. Available from: https://www.ectrx.org/class/pdfPreview.php?year=2011&volume=9&issue=6&spage_number=370 [accessed 26 Aug 2025].

24. Simpkin AL, Robertson LC, Barber VS, et al. Modifiable factors influencing relatives' decision to offer organ donation: systematic review. BMJ. 2009;338:b991. **[Crossref]**

25. Kayıkçı NA. Lise öğrencilerinin organ bağışına bakışı [Master's thesis]. İstanbul: İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü; 2010. Available from: https://nek.istanbul.edu.tr/ekos/TEZ/45858.pdf [accessed 26 Aug 2025].

26. Henderson ML, Clayville KA, Fisher JS, et al. Social media and organ donation: Ethically navigating the next frontier. Am J Transplant. 2017;17:2803-9. **[Crossref]**

27. Morgan SE, Harrison T, Long S, et al. Family discussions about organ donation: how the media influences opinions about donation decisions. Clin Transplant. 2005;19:674-82. **[Crossref]**