Assessment of YouTube videos on post-dural puncture headache: a cross-sectional study (#102406)

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Assessment of YouTube videos on post-dural puncture headache: a cross-sectional study

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Background: Post-dural puncture headache (PDPH) is a common complication of central neuroaxis anesthesia or analgesia, causing severe headaches. YouTube is widely used for health information, but the reliability and quality of PDPH-related content are unclear. This study evaluates the content adequacy, reliability, and quality of YouTube videos on PDPH. **Methods:** This cross-sectional study analyzed English-language YouTube videos on PDPH with good audiovisual quality. Two independent reviewers assessed the videos using the DISCERN instrument, Journal of American Medical Association (JAMA) benchmark criteria, and Global Quality Scale (GQS). Correlations between video characteristics and their reliability, content adequacy, and quality scores were examined. **Results:** Out of 71 videos, 42.3% were uploaded by health-related websites, 36.6% by physicians, and 21.1% by patients. Strong correlations were found between DISCERN, JAMA, and GQS scores ($p<0.001$). Videos from physicians and health-related websites had significantly higher scores than those from patients ($p<0.001$). No significant correlations were observed between descriptive characteristics and scores ($p>0.05$). **Conclusion:** YouTube videos on PDPH uploaded by health-related websites or physicians are more reliable, adequate, and higher in quality than those uploaded by patients. Source credibility is crucial for evaluating medical information on YouTube.

Assessment of YouTube Videos on Post-Dural Puncture Headache: A Cross-Sectional Study

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Abstract

Background: Post-dural puncture headache (PDPH) is a common complication of central neuroaxis anesthesia or analgesia, causing severe headaches. YouTube is widely used for health information, but the reliability and quality of PDPH-related content are unclear. This study evaluates the content adequacy, reliability, and quality of YouTube videos on PDPH.

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Conclusion: YouTube videos on PDPH uploaded by health-related websites or physicians are more reliable, adequate, and higher in quality than those uploaded by patients. Source credibility is crucial for evaluating medical information on YouTube.

Keywords: Post-Dural Puncture Headache, Consumer Health Information, Digital Technology, Social Media, YouTube

Introduction

Post-dural puncture headache (PDPH) is a prevalent and significant complication associated with central neuroaxis anesthesia or analgesia, characterized by dural breach, cerebrospinal fluid leakage, and subsequent postural headache development (Alatni et al. 2024; Aniceto et al. 2023; Bishop et al. 2023). Its incidence varies depending on the demographic and clinical characteristics of the exposed (Aniceto et al. 2023; Bishop et al. 2023). The etiology of PDPH has yet to be fully clarified (Aniceto et al. 2023; Thon et al. 2024). Typically, PDPH presents with postural features that are exacerbated when sitting or standing and alleviated in the supine position. Although PDPH often resolves spontaneously, specific pharmacological or procedural interventions may be required in certain patients(Aniceto et al. 2023). Additionally, adjunctive measures such as bed rest and fluid and caffeine intake are often used in treating PDPH despite the lack of solid evidence showing their benefits (Alatni et al. 2024; Aniceto et al. 2023; Bishop et al. 2023; Thon et al. 2024). In the age of digital media, social media platforms such as YouTube have become increasingly popular sources of medical information for people seeking information about their health conditions (Do et al. 2023). Despite lacking peer review, YouTube's health-related content is attracting the attention of an increasingly larger audience (Chan et al. 2021; Erkin et al. 2023; Lee et al. 2020; Saffi et al. 2020). However, given that these contents consist of a mix of expert-contributed material and potentially contradictory or misleading information, concerns have been raised regarding the reliability and quality of such non-peer-reviewed content (Erkin et al. 2023; Madathil et al. 2015; Saffi et al. 2020; Yildizgoren & Bagcier 2023).

Infodemiology, defined as the study of the dissemination and determinants of medical information through electronic media, has gained prominence in recent years (Goadsby et al.

2023). For many years, “headache” has consistently been among the most searched terms on Google, reflecting the widespread interest in headache-related content on social media platforms (Do et al. 2023; Goadsby et al. 2023). Incorporating unstructured, self-reported data from social media into a scientific framework and relevant medical insights requires methodological rigor (Goadsby et al. 2023). In parallel with this requirement, the number of studies assessing the quality of health-related information on YouTube has risen (Yildizgoren & Bagcier 2023). Although there are some studies that assessed the content and quality of YouTube videos on migraine and cluster headaches, none of these addressed PDPH (Chaudhry et al. 2022; Gupta et al. 2023; Reina-Varona et al. 2022; Saffi et al. 2020). To this end, this study was carried out to assess the quality and reliability of YouTube videos on PDPH and identify the sources that provide high-quality and dependable content.

Materials & Methods

Study Design

This study was designed as a cross-sectional observational study of YouTube videos on PDPH. The study protocol was approved by the local ethical committee (approved on December 26, 2023, with approval number 21). A video-based search was performed on the YouTube online video-sharing platform (https://www.youtube.com/) using the English keywords "post-puncture," "dura," "headache," and "post-dural puncture headache" on 20/01/2024. The keywords were strategically chosen to encompass a broad spectrum of information, including patient characteristics, procedural features, preventive measures, intervals for diagnostic suspicion, conservative and pharmacological treatment modalities, harmful maneuvers, follow-up details, long-term complications, and use of epidural patches.

Content Analysis

Two independent reviewers identified PDPH-related videos on the YouTube website, ranked by popularity. Any bias due to search history and cookies has been avoided using Google Incognito with a private window function. Unaware of each other's evaluation, two authors independently screened the titles and video descriptions for all videos.

The initial search revealed 150 consecutive videos about PDPH. Of these videos, duplicate videos, those published in any language other than English, and those lacking the audiovisual quality needed for accurate assessment were excluded from the study. In the end, the study material consisted of 71 videos.

Videos' Descriptive Characteristics

Videos' descriptive characteristics, i.e., title, publication date, the number of days since upload, video source, country/continent in which the video was uploaded, and video duration (in seconds), were determined and recorded. Video sources were categorized as health-related websites, physicians, and patients.

The number of views, likes, dislikes, and comments were also recorded for each video. Based on these data, the video power index (VPI) was calculated for each video using the following formula: VPI=video like ratio [like/(like+dislike) ×100] x video view ratio [number of views/days]/100[15].

Reliability Assessment

The DISCERN instrument and the Journal of American Medical Association (JAMA) benchmark criteria were used to assess the reliability of the health/medical information in the videos. The 5-point Likert-type DISCERN tool includes 15 "yes/no" items. While eight of these items assess the reliability of the videos, seven assess the quality of information on treatment choices. The total DISCERN score is calculated by adding up the points assigned to the 15 items. Total DISCERN scores between 63-75, 51-62, 39-50, 27–38, and lower than 27 are classified as excellent, good,

fair, poor, and very poor and assigned 5, 4, 3, 2 points, and 1 point, respectively (Chaudhry et al. 2022; Erkin et al. 2023; Yildizgoren & Bagcier 2023). The higher the total DISCERN score, the higher the reliability (Chang & Park 2021; Charnock et al. 1999; Erkin et al. 2023). Accordingly, the total DISCERN scores assigned higher than 3 points, 3 points, and lower than 3 points were considered to indicate high, moderate, and low reliability, respectively (Chaudhry et al. 2022).

JAMA benchmark criteria have also been used to assess the accuracy and reliability of the videos. To this end, four JAMA benchmark criteria, i.e., authorship, disclosure, currency, and attribution, were assigned a score between 0 and 1. Accordingly, the total JAMA score can be between 0 and 4. The higher the JAMA score, the higher the reliability (Chang & Park 2021; Charnock et al. 1999; Erkin et al. 2023; Yildizgoren & Bagcier 2023). The total JAMA scores assigned 4 points, 2 or 3 points, and 0 points or 1 point were considered to indicate completely sufficient, partially sufficient, and insufficient videos, respectively (Erkin et al. 2023).

Quality Assessment

The 5-point Likert type Global Quality Scale (GQS) was used to assess the quality of the health/medical information in the videos. Videos assigned four and five points, three points, and one and two points were considered high, medium, and low-quality videos, respectively (Chang & Park 2021; Chaudhry et al. 2022; Duran & Kizilkan 2021; Erkin et al. 2023). The third reviewer made the final decision in case of a discrepancy between the two reviewers.

Statistical Analysis

In this study, we evaluated the content adequacy, reliability, and quality of the health/medical information provided by the YouTube videos on PDPH. To this end, the descriptive statistics obtained from the collected data were tabulated as median and range (minimum-maximum) values for continuous variables and frequencies and percentages for categorical variables. The normal

distribution characteristics of the continuous variables were analyzed using the Shapiro-Wilk, Kolmogorov-Smirnov, and Anderson-Darling tests based on sample sizes.

In comparing the categorical variables between the groups, Pearson's chi-square test was used for 2x2 tables with expected cells of five or higher, Fisher's exact test was used for 2x2 tables with expected cells less than five, and Fisher-Freeman-Halton test was used for RxC tables. On the other hand, Kruskal-Wallis H and Dwass-Steel-Critchlow-Fligner tests were used to compare normally and non-normally distributed continuous variables between independent groups, respectively. Spearman's Rho correlation coefficient was used to examine the relationships between non-normally distributed variables. Accordingly, correlations with r values between 0.80-1.0, 0.60-0.79, 0.40-0.59, 0.20-0.39, and less than 0.20 were considered very strong, strong, moderate, weak, and very weak, respectively.

Jamovi project 2.3.28 (Jamovi, version 2.3.28.0, 2023, retrieved from https://www.jamovi.org) and JASP 0.18.3 (Jeffreys' Amazing Statistics Program, version 0.18.3, 2024, retrieved from https://jasp-stats.org) software packages were used in the statistical analyses. Probability (p) statistics of ≤ 0.05 were deemed to indicate statistical significance.

Results

The median interval between the upload and evaluation time of the 71 YouTube videos was 836 (min. 17, max. 4921) days. Real-world data was the most common content type, used in 60.6% of evaluated videos. Of the 71 videos, 42.3% were uploaded by health-related websites, 36.6% by physicians and 21.1% by patients. The videos were most commonly sourced from the USA (n=24, 33.8%), followed by India (n=12, 16.9%). The median view, like, dislike, and comment counts were 1130, 26, six, and nine, respectively. The median VPI was 1.15 (min. 0, max. 48.5). The upload and descriptive characteristics of the videos are given in Table 1.

Based on the DISCERN-quality scores, 13 (18.3%) were high quality. In addition, based on total DISCERN scores, a total of 8 (11.2%) videos were classified as good (5.6%) or excellent (5.6%) (Table 2).

The JAMA quality scores revealed that 53.5% and 12.7% of the videos were partially and completely sufficient, respectively, whereas GQS scores indicated that only 29.6% and 18.3% had intermediate and high quality. The r values for the correlations between DISCERN-total and JAMA, DISCERN-total and GQS, and JAMA and GQS scores were 0.703, 0.785, and 0.745, respectively, indicating strong correlations between the reliability and quality scores ($p<0.001$ for all cases). The reliability and quality scores of the videos are given in Table 2.

There were positive correlations between video duration and content adequacy, reliability, and quality scores of the videos ($p<0.05$) (Table 3). Of these correlations, the one between the video duration and the DISCERN-total score was moderate, whereas the ones between the video duration and JAMA and GQS scores were weak ($r=0.473$, $r=0.278$ and $r=0.313$, respectively). Videos' other descriptive characteristics, i.e., view, like, dislike, and comment counts, were not found to be correlated with DISCERN-total, JAMA, and GQS scores ($p>0.05$). The correlations between videos' descriptive characteristics, content adequacy, reliability, and quality scores are detailed in Table 3.

The comparison of the videos based on their sources revealed significant differences in content type ($p<0.001$). Accordingly, real-world videos were more commonly uploaded by physicians and patients than health-related websites, whereas videos with text content were more commonly uploaded by health-related websites and physicians than patients. The median duration and VPI of the videos uploaded by health-related websites and patients were higher, albeit not

177 significantly, than those uploaded by physicians (p=0.621 and p=0.486, respectively). The
178 distribution of videos' characteristics by video sources is given in Table 4.

179 There were significant differences between the reliability and quality scores of the videos
180 categorized according to their sources (p<0.05). Accordingly, the DISCERN-reliability,
181 DISCERN-quality, DISCERN-total, JAMA, and GQS scores in the videos uploaded by physicians
182 and health-related websites were significantly higher than those uploaded by the patients
183 (p<0.001). There was no significant difference between the reliability and quality scores of those
184 videos uploaded by physicians and health-related websites (p>0.05 for all cases). The rate of low
185 and very low-quality videos based on DISCERN-quality and DISCERN-total scores uploaded by
186 patients was significantly higher than those uploaded by physicians and health-related websites
187 (p=0.006 and p=0.008, respectively). Similarly, the rate of videos of inadequate and low quality
188 based on JAMA and GQS scores uploaded by patients was significantly higher than those uploaded
189 by physicians and health-related sites (p<0.001 and p=0.007, respectively). The correlations
190 between the descriptive characteristics and reliability and quality scores of the videos categorized
191 according to their sources are detailed in Table 5.

192 ## Discussion

193 Our study revealed that YouTube videos on PDPH uploaded by physicians or health-related
194 websites were more prevalent and had significantly higher content adequacy, reliability, and
195 quality than those uploaded by patients. We found significant correlations between the videos'
196 descriptive characteristics, content adequacy, reliability, and quality scores, both overall and when
197 the videos were classified by their source.

198 The role of social media in disseminating headache-related information is increasing.
199 However, there are a limited number of studies that assessed YouTube videos on headaches, such

as migraine or cluster headaches (Chaudhry et al. 2022; Do et al. 2023; Goadsby et al. 2023; Gupta et al. 2023; Reina-Varona et al. 2022; Saffi et al. 2020). In one of these studies, Chaudhry et al. analyzed 134 YouTube videos on cluster headaches and found that almost half of the videos were of low quality according to the GQS scores, and nearly three-quarters of the videos were of low quality according to the DISCERN scores (2022). The findings of our study, the first to investigate the reliability and quality of YouTube videos in PDPH, are consistent with Chaudhry et al.'s findings (2022). These findings raise concerns about the potential risks faced by patients who rely on YouTube for medical information and point to the need to improve the quality and reliability of even content provided by healthcare providers (Altunisik & Firat 2022; Baker et al. 2021; Mohile et al. 2023). It is reported in the literature that YouTube videos about medical topics are most commonly created by physicians (Erkin et al. 2023; Saffi et al. 2020). Gupta et al. reported that nearly two-thirds of the videos on migraine were published by physicians, hospitals, and healthcare providers (2023). Another study reported that videos published by healthcare professionals/institutions and videos featuring personal healthcare experiences were more frequent than others (Chaudhry et al. 2022). Saffi et al. reported that only about one-fourth of the videos have been published by healthcare professionals/institutions and universities (2020). In comparison, we found that almost four-fifths of the videos were uploaded by health-related websites and physicians.

Several studies assessed videos' content adequacy, reliability, and quality by their sources (Arslan et al. 2023; Gupta et al. 2023; Ng et al. 2021; Onder & Zengin 2021). In one of these studies, where patients were not specified as a separate source, no significant difference was found between the GQS and DISCERN-reliability scores of YouTube videos categorized according to their sources (Gupta et al. 2023). Other studies reported that the YouTube videos on diseases

uploaded by healthcare professionals had better quality than those uploaded by different sources (Ng et al. 2021; Onder & Zengin 2021). Similarly, we found that the videos uploaded by physicians and health-related websites had higher content adequacy, reliability, and quality scores than those uploaded by patients. These findings underscore the importance of considering the source when evaluating the credibility of online medical information (Bayram & Pinar 2023). On the other hand, the discrepancies between the findings of the studies in question may be attributed to the fact that primarily GQS, which does not focus on the information itself, has been used to rate the videos' quality and content adequacy along with differences in the technical characteristics of the videos and the characteristics of medical topics explored, such as popularity (Chaudhry et al. 2022).

The correlations between the descriptive characteristics and the reliability and quality scores of the videos have been investigated in various studies. Accordingly, most studies reported that higher view and like counts were significantly associated with higher reliability and quality of the videos, while some studies reported negative correlations between the audience engagement parameters and DISCERN and GQS scores (Duran & Kizilkan 2021; Erkin et al. 2023). In comparison, we did not find significant correlations between these parameters. Then again, the sources of the videos may impact their descriptive characteristics. As a matter of fact, YouTube videos about migraine uploaded by "others" had higher VPI values than those uploaded by other subcategories (Gupta et al. 2023). These higher VPI values were attributed to higher view counts, reflecting the content's straightforwardness, greater ease of understanding, and public relatability.

In contrast, even though we found strong correlations between the content adequacy, reliability, and quality scores of the videos categorized according to their sources, we did not find any significant difference between their descriptive characteristics.

The primary limitation of our study was its cross-sectional design, featuring the YouTube videos on PDPH published in English only. The fact that the PDPH videos published only on YouTube were included in the study may be deemed another limitation.

Conclusions

Our study sheds light on the reliability and quality of the YouTube videos on PDPH. Our finding that the YouTube videos on PDPH uploaded by physicians or health-related websites were more prevalent and had higher content adequacy, reliability, and quality scores than those uploaded by patients underscores the importance of considering the source of the video when assessing the credibility of the medical information addressed in the videos.

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References are not written according to journal rules. Re-arrangement is recommended.

Table 1(on next page)

Characteristics and descriptive data of YouTube videos on post-dural puncture headache.

Table 1. Characteristics and descriptive data of YouTube videos on post-dural puncture headache.

		Overall (n=71)
Days since upload date †		836.0 [17.0 – 4921.0]
Duration in seconds †		530.0 [61.0 – 3411.0]
Content type ‡	Animation	5 (7.0)
	Real-world	43 (60.6)
	Text	23 (32.4)
Video source ‡	Physicians	26 (36.6)
	Health-related websites	30 (42.3)
	Patients	15 (21.1)
Country of origin ‡	United States of America	24 (33.8)
	India	12 (16.9)
	Canada	3 (4.2)
	Others	12 (16.9)
	Unknown	20 (28.2)
View count †		1130.0 [2.0 – 63366.0]
Likes ‡	No	10 (14.1)
	Yes	61 (85.9)
Number of likes †		26.0 [1.0 – 324.0]
Dislikes ‡	No	50 (70.4)
	Yes	21 (29.6)
Number of dislikes †		6.0 [2.0 – 25.0]
Comments ‡	No	28 (39.4)
	Yes	43 (60.6)
Number of comments †		9.0 [1.0 – 129.0]
VPI †		1.15 [0.0 – 48.5]

†: median [min-max], ‡: n (%)
VPI: Video popularity index

Table 2(on next page)

Data about the reliability, content adequacy, and quality parameters of YouTube videos on post-dural puncture headache.

Table 1. Data about the reliability, content adequacy, and quality parameters of YouTube videos on post-dural puncture headache.

		Overall (n=71)
Part 1: DISCERN-reliability †		19.0 [8.0 – 40.0]
Part 2: DISCERN-treatment †		16.0 [7.0 – 35.0]
Part 3: DISCERN-quality†		2.0 [1.0 – 5.0]
Reliability categories based on DISCERN-quality ‡	Poor (score <3)	38 (53.5)
	Moderate (score 3)	20 (28.2)
	High (score >3)	13 (18.3)
DISCERN-total †		34.0 [15.0 – 75.0]
Categories for DISCERN-total ‡	Very poor (15-27)	17 (23.9)
	Poor (28–38)	29 (40.8)
	Fair/medium (39–50)	17 (23.9)
	Good (51–62)	4 (5.6)
	Excellent (63–75)	4 (5.6)
JAMA source †		2.0 [1.0 – 5.0]
JAMA content/quality categories ‡	Insufficient (scores 0 and 1)	24 (33.8)
	Partially sufficient (scores 2 and 3)	38 (53.5)
	Completely sufficient (score 4)	9 (12.7)
GQS †		2.0 [1.0 – 5.0]
GQS categories ‡	Low (scores 1 and 2)	37 (52.1)
	Intermediate (score 3)	21 (29.6)
	High (scores 4 and 5)	13 (18.3)

†: median [min-max], ‡: n (%)
JAMA: Journal of American Medical Association benchmark criteria, GQS: Global Quality Score.

Table 3(on next page)

Correlation of the descriptive data of the videos with the DISCERN-total, JAMA, and GQS scores.

Table 3. Correlation of the descriptive data of the videos with the DISCERN-total, JAMA, and GQS scores.

	DISCERN-total		JAMA source		GQS	
	r	p	r	p	r	p
Duration in seconds	0.473	**<0.001**	0.278	**0.019**	0.313	**0.008**
View count	-0.211	0.077	-0.108	0.370	-0.196	0.102
Number of likes	-0.104	0.425	-0.012	0.928	-0.031	0.811
Number of dislikes	-0.294	0.195	-0.031	0.895	-0.021	0.928
Number of comments	-0.213	0.170	-0.182	0.244	-0.136	0.385

JAMA: Journal of American Medical Association benchmark criteria, GQS: Global Quality Score.
r: Spearman's rho coefficient.

Table 4(on next page)

Characteristics and descriptive data of YouTube videos on post-dural puncture headache based on video sources.

Table 4. Characteristics and descriptive data of YouTube videos on post-dural puncture headache based on video sources.

	Video Source			p
	Physicians (n=26)	**Health-related websites** (n=30)	**Patients** (n=15)	
Days since upload date †	802.5 [17.0 – 4771.0]	791.0 [116.0 – 4639.0]	1609.0 [263.0 – 4921.0]	0.212
Duration in seconds †	383.0 [74.0 – 3411.0]	616.5 [73.0 – 2494.0]	595.0 [61.0 – 1966.0]	0.621
Content type ‡				
Animation	0 (0.0) [a]	5 (16.7) [b]	0 (0.0) [a, b]	**<0.001**
Real-world	18 (69.2) [a]	10 (33.3) [b]	15 (100.0) [c]	
Text	8 (30.8) [a]	15 (50.0) [a]	0 (0.0) [b]	
Country of origin ‡				
United States of America	6 (23.1)	10 (33.3)	8 (53.3)	0.484
India	6 (23.1)	5 (16.7)	1 (6.7)	
Canada	0 (0.0)	2 (6.7)	1 (6.7)	
Others	5 (19.2)	6 (20.0)	1 (6.7)	
Unknown	9 (34.6)	7 (23.3)	4 (26.7)	
View count †	769.5 [2.0 – 63366.0]	772.5 [32.0 – 40626.0]	6018.0 [61.0 – 36690.0]	0.053
Likes ‡	20 (76.9)	28 (93.3)	13 (86.7)	0.228
Number of likes †	23.5 [2.0 – 309.0]	24.0 [1.0 – 324.0]	55.0 [3.0 – 290.0]	0.327
Dislikes ‡	7 (26.9)	7 (23.3)	7 (46.7)	0.251
Number of dislikes †	3.0 [2.0 – 25.0]	7.0 [2.0 – 14.0]	6.0 [4.0 – 17.0]	0.404
Comments ‡	15 (57.7)	16 (53.3)	12 (80.0)	0.210
Number of comments †	6.0 [1.0 – 46.0]	3.5 [1.0 – 129.0]	11.5 [2.0 – 114.0]	0.277
VPI †	0.6 [0.0 – 48.5]	1.3 [0.0 – 21.9]	1.3 [0.0 – 25.9]	0.486

†: median [min-max], ‡: n (%)
VPI: Video popularity index

Table 5(on next page)

Comparison of the reliability, content adequacy, and quality of YouTube videos on post-dural puncture headache based on video sources.

Table 5. Comparison of the reliability, content adequacy, and quality of YouTube videos on post-dural puncture headache based on video sources.

	Video Source			p
	Physicians (n=26)	**Health-related websites** (n=30)	**Patients** (n=15)	
Part 1: DISCERN-reliability †	18.0 [14.0 – 40.0]	21.0 [12.0 – 40.0]	12.0 [8.0 – 19.0]	**<0.001**
Part 2: DISCERN-treatment †	16.0 [9.0 – 35.0]	17.0 [7.0 – 35.0]	13.0 [7.0 – 23.0]	0.165
Part 3: DISCERN-quality †	3.0 [1.0 – 5.0]	3.0 [1.0 – 5.0]	1.0 [1.0 – 3.0]	**<0.001**
Reliability categories based on DISCERN-quality ‡				
Poor (score <3)	11 (42.3) [a]	13 (43.3) [a]	14 (93.3) [b]	
Moderate (score 3)	11 (42.3) [a]	8 (26.7) [a, b]	1 (6.7) [b]	**0.006**
High (score >3)	4 (15.4) [a, b]	9 (30.0) [b]	0 (0.0) [a]	
DISCERN-total †	34.0 [23.0 – 75.0]	38.0 [20.0 – 75.0]	27.0 [15.0 – 42.0]	**<0.001**
Categories for DISCERN-total ‡				
Very poor (15-27)	3 (11.5) [a]	4 (13.3) [a]	10 (66.7) [b]	
Poor (28–38)	13 (50.0) [a]	12 (40.0) [a]	4 (26.7) [a]	
Fair/medium (39–50)	8 (30.8) [a]	8 (26.7) [a]	1 (6.7) [a]	**0.008**
Good (51–62)	1 (3.8) [a]	3 (10.0) [a]	0 (0.0) [a]	
Excellent (63–75)	1 (3.8) [a]	3 (10.0) [a]	0 (0.0) [a]	
JAMA source †	2.0 [1.0 – 4.0]	2.0 [1.0 – 5.0]	1.0 [1.0 – 2.0]	**<0.001**
JAMA quality/content categories ‡				
Insufficient (scores 0 and 1)	4 (15.4) [a]	6 (20.0) [a]	14 (93.3) [b]	
Partially sufficient (scores 2 and 3)	20 (76.9) [a]	17 (56.7) [a]	1 (6.7) [b]	**<0.001**
Completely sufficient (score 4)	2 (7.7) [a, b]	7 (23.3) [b]	0 (0.0) [a]	
GQS †	3.0 [2.0 – 5.0]	3.0 [1.0 – 5.0]	1.0 [1.0 – 3.0]	**<0.001**
GQS categories ‡				
Low (scores 1 and 2)	10 (38.5) [a]	13 (43.3) [a]	14 (93.3) [b]	
Intermediate (score 3)	10 (38.5) [a]	10 (33.3) [a]	1 (6.7) [b]	**0.007**
High quality (scores 4 and 5)	6 (23.1) [a]	7 (23.3) [a]	0 (0.0) [b]	

†: median [min-max], ‡: n (%)

JAMA: Journal of American Medical Association benchmark criteria, GQS: Global Quality Score.

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