



## Research Article

# Analyzing the educational quality of YouTube videos on paravertebral block techniques

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## ABSTRACT

**Aim:** People can learn new skills, explore content related to their interests, and get to know different cultures through YouTube videos. It is important to be conscious when using platforms such as YouTube and to take care to obtain information from verified and reliable sources. Students especially watch medical videos on YouTube, which can improve their medical knowledge. Our aim in this study is to evaluate the educational content and quality of paravertebral block videos on YouTube.

**Materials and Method:** Videos were recorded by typing the term 'paravertebral block ultrasound' into the YouTube search engine. In filtering, sorting was done according to the number of views. 100 videos on the first 5 pages were watched and evaluated. To evaluate the videos on YouTube, we used two different surveys, evaluating the educational content of the videos (Survey 1) and evaluating the quality of the videos (Survey 2).

**Results:** Our study revealed that only a third of paravertebral block education videos met relevant criteria, with just (33) 18.2% demonstrating both good educational quality and preparation. There was a positive correlation between the video educational quality score and all parameters, with significant differences found for "video duration" and "video preparation quality score" ( $r=0.506$ ,  $p=0.003$ , and  $r=0.84$ ,  $p<0.001$ , respectively). Similarly, the video preparation quality score showed a positive correlation with all parameters, with significant differences found for "number of video likes" and "video duration" ( $r=0.373$ ,  $p=0.033$ , and  $r=0.413$ ,  $p=0.017$ , respectively).

**Conclusions:** Paravertebral block videos on YouTube are inadequate in terms of educational and preparation quality. According to our analysis, we do not recommend using YouTube videos for educational purposes.

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## 1. Introduction

Nowadays, the use of the internet and social media has become an important part of our lives. Internet use and social media use provide us with information on many issues in daily life, including health. Founded in 2005, YouTube offers a wide range of content, allowing its users to obtain information from different perspectives in education, entertainment, news, art, and many

other fields [1]. People can learn new skills, explore content related to their interests, and get to know different cultures through YouTube videos. This platform also provides an environment where people can share their experiences, ideas, and talents. While social media tools can provide quick and easy access to medical information, the widespread use of the internet and social media brings with it some problems, such as access to misinformation [2]. It is important to be conscious when

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using these platforms and to take care to obtain information from verified and reliable sources. Medical videos on YouTube are especially useful for students because they are monitored and can contribute to their medical skills. When watching such videos, viewers need to pay attention to the sources, the expertise of the person who created the video, and whether the content is based on a solid scientific basis. Choosing videos from official medical institutions or well-known medical experts may be a more reliable way to ensure reliability [3–6]. Platforms such as YouTube have great potential for healthcare education and training. Many health-related videos may have poor educational quality, rely on uncertain sources, have security issues, lack vetting of content, and have inaccurate information. This can make it difficult and even misleading for viewers to access accurate and reliable information [7,8].

Although there are very few studies on the evaluation of regional anesthesia procedures on YouTube, there are some studies explaining the problems related to the reliability and quality of the studies [9–11]. Anesthesiologists and assistants are now frequently performing interfascial plane blocks. There are many videos on YouTube about interfascial plane blocks. Studies have investigated the effectiveness of YouTube videos on some of the interfascial plane blocks [9, 12]. Paravertebral block, one of the interfascial plane blocks, is one of the interfascial plane blocks with the highest complication rate and the highest risk of local anesthetic toxicity due to its proximity to the spinal cord, vascular structures, and pleura [13–15]. Our aim in this study is to evaluate the educational content and quality of paravertebral block videos on YouTube.

## 2. Materials and Method

Animals and human subjects were not used in this study. Therefore, ethics committee approval is not required in this study. Searching for videos on YouTube and recording the URLs was completed by one of the re-

searchers in a single session on October 22, 2023. The videos were searched by typing the term 'paravertebral block ultrasound' into the YouTube search engine. In filtering, sorting was done according to the number of views. Two anesthesiologists with at least five years of clinical experience with interfascial plane blocks watched and evaluated 100 videos on the first five pages of YouTube. To evaluate the videos on YouTube, we used two different surveys, evaluating the educational content of the videos (Survey 1) and evaluating the quality of the videos (Survey 2).

### 2.1. Inclusion and exclusion criteria

Videos in English; videos with ultrasound guidance; and videos about the paravertebral block were included in the study. The study included only videos in English to ensure standardization because it is the most widely used language. Videos without ultrasound images, irrelevant to the topic, lacking sound, or duplicates were excluded. Additionally, according to similarly study videos, shorter than one minute or longer than 20 minutes were not considered. This is because videos shorter than a minute typically provide insufficient information for evaluation, and longer videos could diminish evaluator objectivity [9,12].

- Survey 1: It consists of 14 questions. It questions the educational content of the videos. We created this survey form with reference to previous studies (Table 1) [9,10,16].
- Survey 2: It consists of 14 questions and evaluates the quality of the preparation of the videos. (Table 2). According to the American National Career Development Association's (NCDA) guide, we created Survey 2 [17].

Anaesthesiologists who evaluated the videos scored each question between 0 and 5. (0-very bad, 1-bad, 2-fair, 3-good, 4-very good, 5-excellent). Each video was scored between 0-70 according to the questions shown in surveys 1 and 2 (0-14: very bad, 15-28: bad, 29-42: fair, 43-56: good, 57-70: very good).

**Table 1.** Evaluation of the video educational content.

Survey 1: Questions
1 Are the clinical indications for paravertebral block clearly explained?
2 Are anatomical landmarks clearly explained or marked?
3 Has the anatomy of paravertebral block been clearly explained?
4 Has the suspected mechanism of action been clearly explained?
5 Has technical information regarding probe selection and frequency of the ultrasound device been explained?
6 Has ultrasound anatomy been clearly demonstrated and explained?
7 Were the recorded sono-anatomical images and anatomical structures in the recording clear and easy to perceive?
8 Was the ultrasound image of the needle visible and easy to follow?
9 Are instructions regarding depth, alignment and direction of needle movements clearly explained?
10 Has information regarding the spread of local anesthetic been explained?
11 Is information about in-plane or out-of-plane technique given in the video?
12 Has sterile technique been clearly explained or emphasized?
13 Has the information regarding the local anesthetic agent been explained clearly?
14 Have the possible complications associated with this block technique been explained?

**Table 2.** Quality of the video preparation.

Survey 2: Questions
1 Is the purpose of the video clearly stated and explained in the first quarter of the video?
2 Was the title or name of the video appropriate to the purpose of the video?
3 Were the design and content of the video suitable for the intended educational purpose?
4 Have the skills and technique of the procedure been explained using a standard, comparable, "step-by-step" method?
5 Was the information provided in the video useful for viewers to develop/improve their skill base?
6 Was the content of the video appropriate for the health and safety of both the patient and the practitioner?
7 Was the quality of the picture acceptable in terms of colors and clarity?
8 Was the quality of the video audio acceptable? (No sounds should be scored as zero)
9 Was the length of the video balanced with the content of the video?
10 Is information on production or release date, producers and references clearly explained?
11 Are the objectives, learning tasks and terminology clearly stated in the video to enable viewers to perform these tasks?
12 Does the video contain additional aids such as stop-and-discuss points, scenarios, and/or summary of the procedure?
13 Has information been provided about a way to evaluate the effectiveness and repeatability of the video?
14 Did the content of the video encourage viewers to move from passive spectators to active practitioners in the implementation of the practice? Technical?

## 2.2. The following data were recorded for the videos

The relevant URLs of the videos, the duration of the videos, the number of days the videos were available, the number of viewers of the videos, the source of the videos (whether academic or not), the total number of likes of the videos, and the survey 1 and survey 2 scores given to the videos by experts.

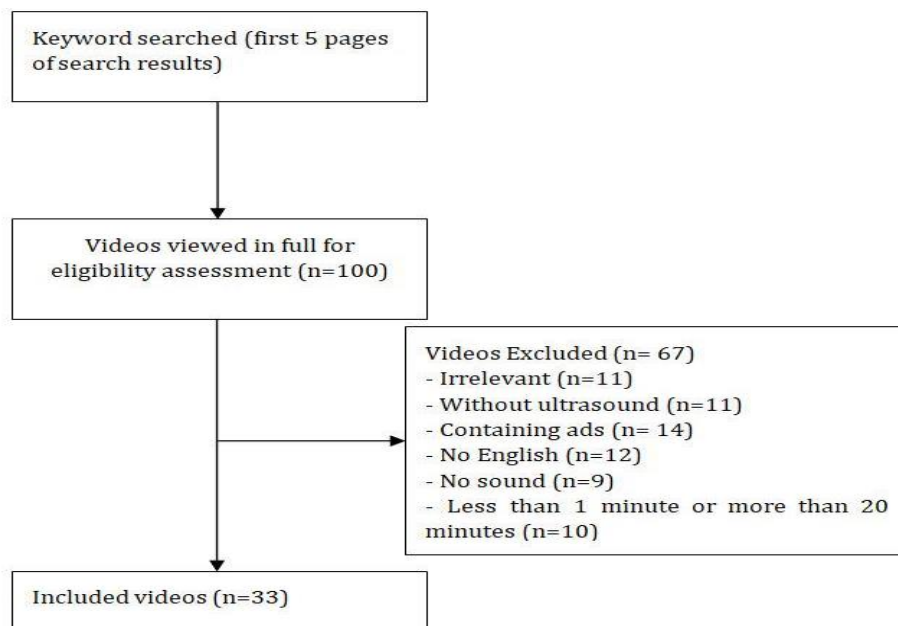
## 2.3. Statistical analyses

IBM-Statistical Package for Social Sciences (IBM-SPSS Inc., Chicago, IL, USA) 22.0 program was used to analyze the data obtained in the study. The suitability of the data for normal distribution was examined with the "Shapiro-Wilk test." Continuous variables were expressed as medians (25–75 percentiles) according to their distribution

status, and categorical variables were expressed as numbers and percentages. 'Spearman rho correlation test' was applied in the correlation analysis for continuous variables. The statistical significance level was accepted as  $p < 0.05$ .

## 3. Results

By typing the word "paravertebral block ultrasound" on the YouTube site, a total of 100 videos appearing on the first 5 pages were evaluated. 67 of these videos were excluded from the study according to the study exclusion criteria. Of these, 11 were irrelevant, 14 contained advertisements, 11 contained no ultrasound, 12 were in a language other than English, 10 were less than a minute or longer than 20 minutes, and 9 were without audio narration. Thus, 33 videos were included in the study (Fig. 1).

**Fig. 1.** Flow chart of the study.

When video characteristics are evaluated, "number of video views" is 4096 (1531-25501), "number of video likes" is 64 (18-236) median (25-75 percentile), and "video duration (seconds)" is 752 (500-1753) median (25-75 percentile).

The video educational quality score was 6 (18.2%) as "good" and 5 (15.2%) as "very bad," and the median (25-75 percentile) video educational quality score was 30 [17-40]. The video preparation quality score was 6

(18.2%) as "good" and 9 (27.3%) as "bad," and the median (25-75 percentile) video preparation quality score was 31 [24-38] (Table 3).

The 14 parameters and evaluation scores examined for the video educational quality score are shown separately in Table 4.

The 14 parameters and evaluation scores examined for the video preparation quality score are shown separately in Table 5.

**Table 3.** Video characteristics and quality score values.

Video characteristic feature	n (%) or median (25-75th percentile)	
Video views	4096 (1531-25501)	
Number of Video Likes	64 (18-236)	
Video duration (seconds)	752 (500-1753)	
Video educational quality score	30 (17-40)	
Video educational quality score classification	Too bad	5 (15.2%)
	Bad	10 (30.3%)
	It will do	12 (36.4%)
	Good	6 (18.2%)
Video preparation quality score	31 (24-38)	
Video preparation quality score classification	Too bad	1 (3%)
	Bad	9 (27.3%)
	It will do	17 (51.5%)
	Good	6 (18.2%)

**Table 4.** Video educational quality questions (part 1).

Question	Degree	n (%)
Are the clinical indications for paravertebral block clearly explained?	Too bad	7 (21.2%)
	Bad	7 (21.2%)
	It will do	1 (3%)
	Good	2 (6.1%)
	Very good	5 (15.2%)
	Perfect	11 (33.3%)
Are anatomical landmarks clearly explained or marked?	Too bad	1 (3%)
	Bad	3 (9.1%)
	It will do	3 (9.1%)
	Good	7 (21.2%)
	Very good	13 (39.4%)
	Perfect	6 (18.2%)
Has the anatomy of paravertebral block been clearly explained?	Too bad	0 (0%)
	Bad	3 (9.1%)
	It will do	4 (12.1%)
	Good	8 (24.2%)
	Very good	7 (21.2%)
	Perfect	11 (33.3%)

**Table 4.** Video educational quality questions (part 2).

Has the suspected mechanism of action been clearly explained?	Too bad	3 (9.1%)
	Bad	11 (33.3%)
	It will do	8 (24.2%)
	Good	2 (6.1%)
	Very good	3 (9.1%)
	Perfect	6 (18.2%)
Regarding probe selection and frequency of the ultrasound device been explained?	Too bad	7 (21.2%)
	Bad	9 (27.3%)
	It will do	6 (18.2%)
	Good	8 (24.2%)
	Very good	2 (6.1%)
	Perfect	1 (3%)
Has ultrasound anatomy been clearly demonstrated and explained?	Too bad	1(3%)
	Bad	4 (12.1%)
	It will do	8 (24.2%)
	Good	8 (24.2%)
	Very good	9 (27.3%)
	Perfect	3 (9.1%)
Were the recorded sono-anatomical images and anatomical structures in the recording clear and easy to perceive?	Too bad	3 (9.1%)
	Bad	2 (6.1%)
	It will do	9 (27.3%)
	Good	9 (27.3%)
	Very good	9 (27.3%)
	Perfect	1 (3%)
Was the ultrasound image of the needle visible and easy to follow?	Too bad	9 (27.3%)
	Bad	3 (9.1%)
	It will do	3 (9.1%)
	Good	6 (18.2%)
	Very good	12 (36.4%)
	Perfect	0 (0%)
Are instructions for depth, alignment, and direction of needle movements clearly explained?	Too bad	9 (27.3%)
	Bad	9 (27.3%)
	It will do	8 (24.2%)
	Good	7 (21.2%)
	Very good	0 (0%)
	Perfect	0 (0%)
Has information regarding local anesthetic dissemination been explained?	Too bad	6 (18.2%)
	Bad	12 (36.4%)
	It will do	8 (24.2%)
	Good	4 (12.1%)
	Very good	3 (9.1%)
	Perfect	0 (0%)
Was information given about the in-plane or out-of-plane technique in the video?	Too bad	10 (30.3%)
	Bad	5 (15.2%)
	It will do	6 (18.2%)
	Good	6 (18.2%)
	Very good	4 (12.1%)
	Perfect	2 (6.1%)

**Table 4.** Video educational quality questions (part 3).

Has sterile technique been clearly explained or emphasized?	Too bad	29 (87.9%)
	Bad	3 (9.1%)
	It will do	0 (0%)
	Good	1 (3%)
	Very good	0 (0%)
	Perfect	0 (0%)
Was the information regarding the local anesthetic agent explained clearly?	Too bad	20 (60.6%)
	Bad	4 (12.1%)
	It will do	3 (9.1%)
	Good	1 (3%)
	Very good	4 (12.1%)
	Perfect	1 (3%)
Have possible complications related to this block technique been explained?	Too bad	7 (21.2%)
	Bad	8 (24.2%)
	It will do	3 (9.1%)
	Good	8 (24.2%)
	Very good	3 (9.1%)
	Perfect	4 (12.1%)

**Table 5.** Video preparation quality questions (part 1).

Question	Degree	n (%)
Is the purpose of the video clearly stated and explained in the first quarter of the video?	Too bad	2 (6.1%)
	Bad	6 (18.2%)
	It will do	8 (24.2%)
	Good	10 (30.3%)
	Very good	7 (21.2%)
	Perfect	0 (0%)
Was the title or name of the video appropriate to the purpose of the video?	Too bad	1 (3%)
	Bad	0 (0%)
	It will do	3 (9.1%)
	Good	5 (15.2%)
	Very good	18 (54.5%)
	Perfect	6 (18.2%)
Were the design and content of the video suitable for the intended educational purpose?	Too bad	0 (0%)
	Bad	1 (3%)
	It will do	7 (21.2%)
	Good	11 (33.3%)
	Very good	11 (33.3%)
	Perfect	3 (9.1%)
Have the skills and technique of the procedure been explained using a standard, comparable, "step-by-step" method?	Too bad	3 (9.1%)
	Bad	11 (33.3%)
	It will do	6 (18.2%)
	Good	8 (24.2%)
	Very good	5 (15.2%)
	Perfect	0 (0%)

**Table 5.** Video preparation quality questions (part 2).

Was the information provided in the video useful for viewers to develop/improve their skill base?	Too bad	0 (0%)
	Bad	3 (9.1%)
	It will do	8 (24.2%)
	Good	13 (39.4%)
	Very good	7 (21.2%)
	Perfect	2 (6.1%)
Was the content of the video appropriate for the health and safety of both the patient and the practitioner?	Too bad	1 (3%)
	Bad	0 (0%)
	It will do	7 (21.2%)
	Good	13 (39.4%)
	Very good	10 (30.3%)
	Perfect	2 (6.1%)
Was the quality of the picture acceptable in terms of colors and clarity?	Too bad	0 (0%)
	Bad	0 (0%)
	It will do	10 (30.3%)
	Good	15 (45.5%)
	Very good	6 (18.2%)
	Perfect	2 (6.1%)
Was the quality of the video audio acceptable? (No sounds should be scored as zero	Too bad	1 (3%)
	Bad	2 (6.1%)
	It will do	1 (3%)
	Good	7 (21.2%)
	Very good	21 (63.6%)
	Perfect	1 (3%)
Was the length of the video balanced with the content of the video?	Too bad	0 (0%)
	Bad	3 (9.1%)
	It will do	7 (21.2%)
	Good	13 (39.4%)
	Very good	10 (30.3%)
	Perfect	0 (0%)
Is information about the production or release date, producers and references clearly explained?	Too bad	19 (57.6%)
	Bad	7 (21.2%)
	It will do	1 (3%)
	Good	5 (15.2%)
	Very good	0 (0%)
	Perfect	1 (3%)
Are the objectives, learning tasks, and terminology clearly stated in the video to enable viewers to accomplish these tasks?	Too bad	10 (30.3%)
	Bad	11 (33.3%)
	It will do	5 (15.2%)
	Good	5 (15.2%)
	Very good	1 (3%)
	Perfect	1 (3%)
Does the video include additional aids such as stop-and-discuss points, scenarios, and/or summary of the procedure?	Too bad	18 (54.5%)
	Bad	5 (15.2%)
	It will do	7 (21.2%)
	Good	1 (3%)
	Very good	2 (6.1%)
	Perfect	0 (0%)

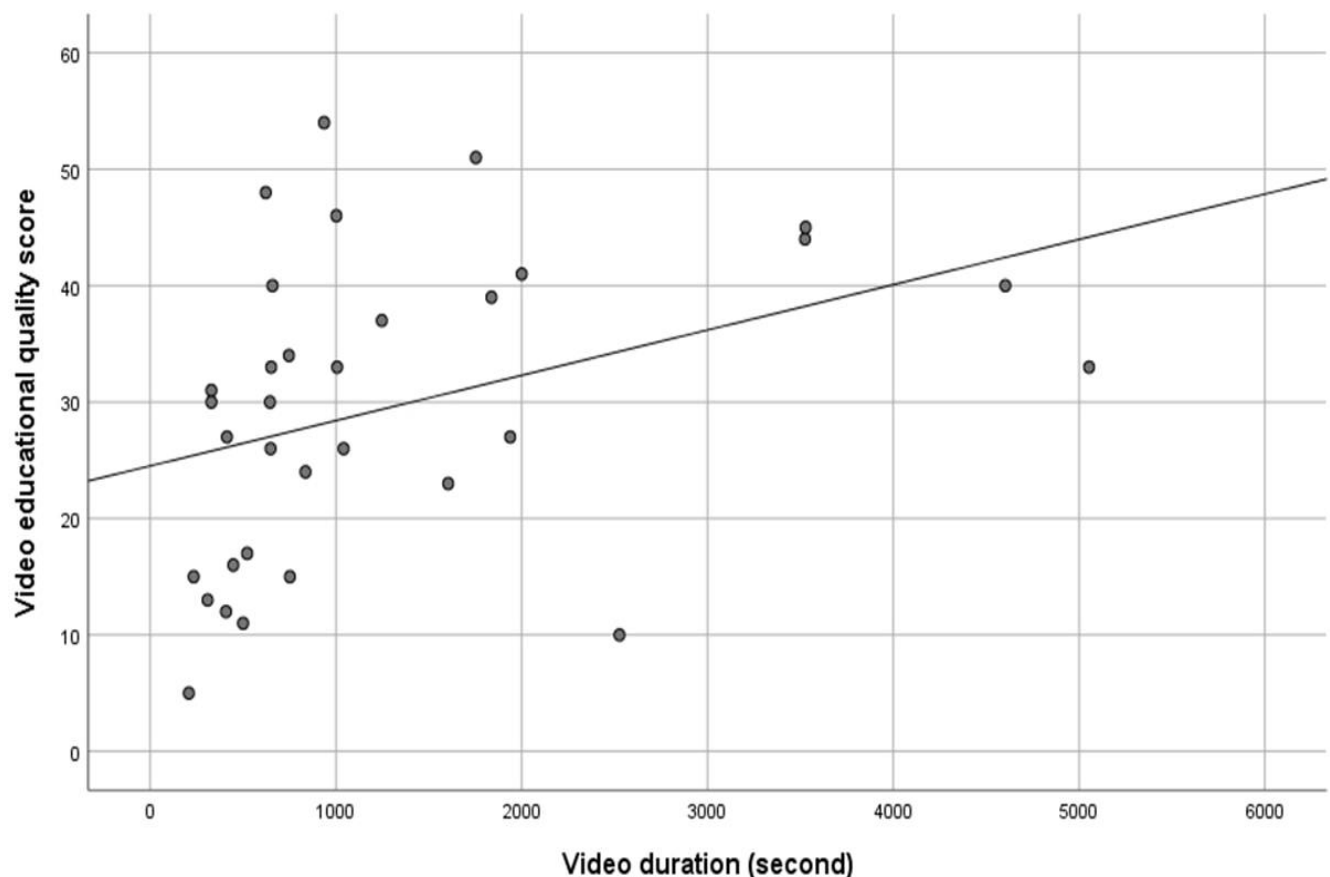
**Table 5.** Video preparation quality questions (part 3).

Was information provided about a way to evaluate the effectiveness and repeatability of the video?	Too bad	32 (97%)
	Bad	1 (3%)
	It will do	0 (0%)
	Good	0 (0%)
	Very good	0 (0%)
	Perfect	0 (0%)
Did the content of the video encourage viewers to shift from passive spectator to active practitioner in the implementation of the practice? Technical?	Too bad	4 (12.1%)
	Bad	6 (18.2%)
	It will do	7 (21.2%)
	Good	6 (18.2%)
	Very good	9 (27.3%)
	Perfect	1 (3%)

When looking at the relationship between the video educational quality score, video characteristics, and video preparation quality score; there was a positive correlation between the video educational quality score and all parameters. While this correlation was not statistically significant for "number of video views" and "number of video likes" ( $r=0.155$ ,  $p=0.388$ , and  $r=0.314$ ,  $p=0.075$ , respectively), there was a statistically significant difference for "video duration (duration)" and "video preparation quality score" ( $r=0.506$ ,  $p=0.003$ , and

$r=0.84$ ,  $p<0.001$ , respectively) (Figs. 2 and 3).

When looking at the relationship between video preparation quality score and video characteristics; there was a positive correlation between the video preparation quality score and all parameters. While this correlation was not statistically significant for "number of video views" ( $r=0.3$ ,  $p=0.09$ ), there was a statistically significant difference for "number of video likes" and "video duration (second)" ( $r=0.373$ ,  $p=0.033$ , and  $r=0.413$ ,  $p=0.017$ , respectively) (Figs. 4 and 5).

**Fig. 2.** Relationship between video educational quality score and video duration.



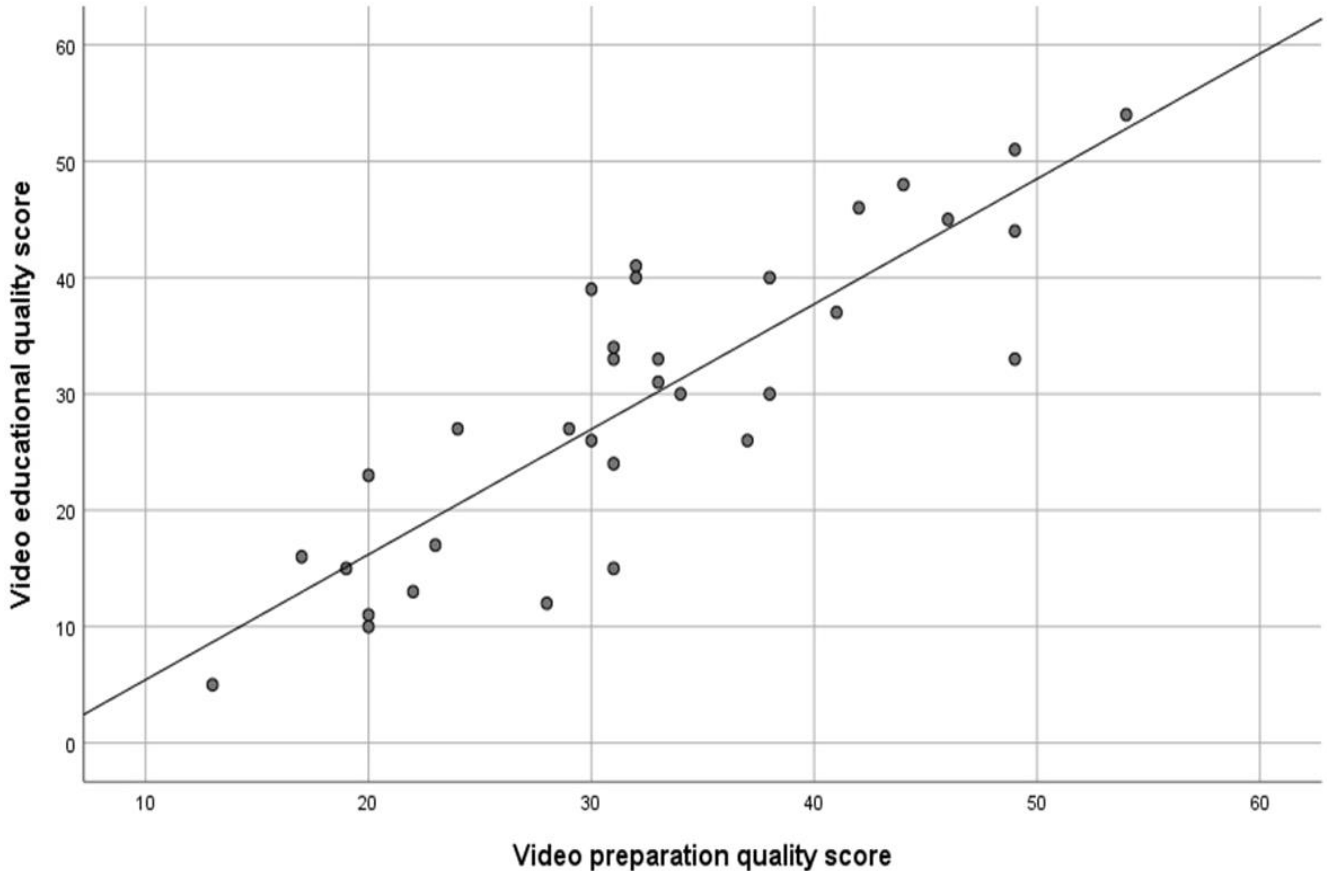


Fig. 3. Relationship between video educational quality score and video preparation quality score.

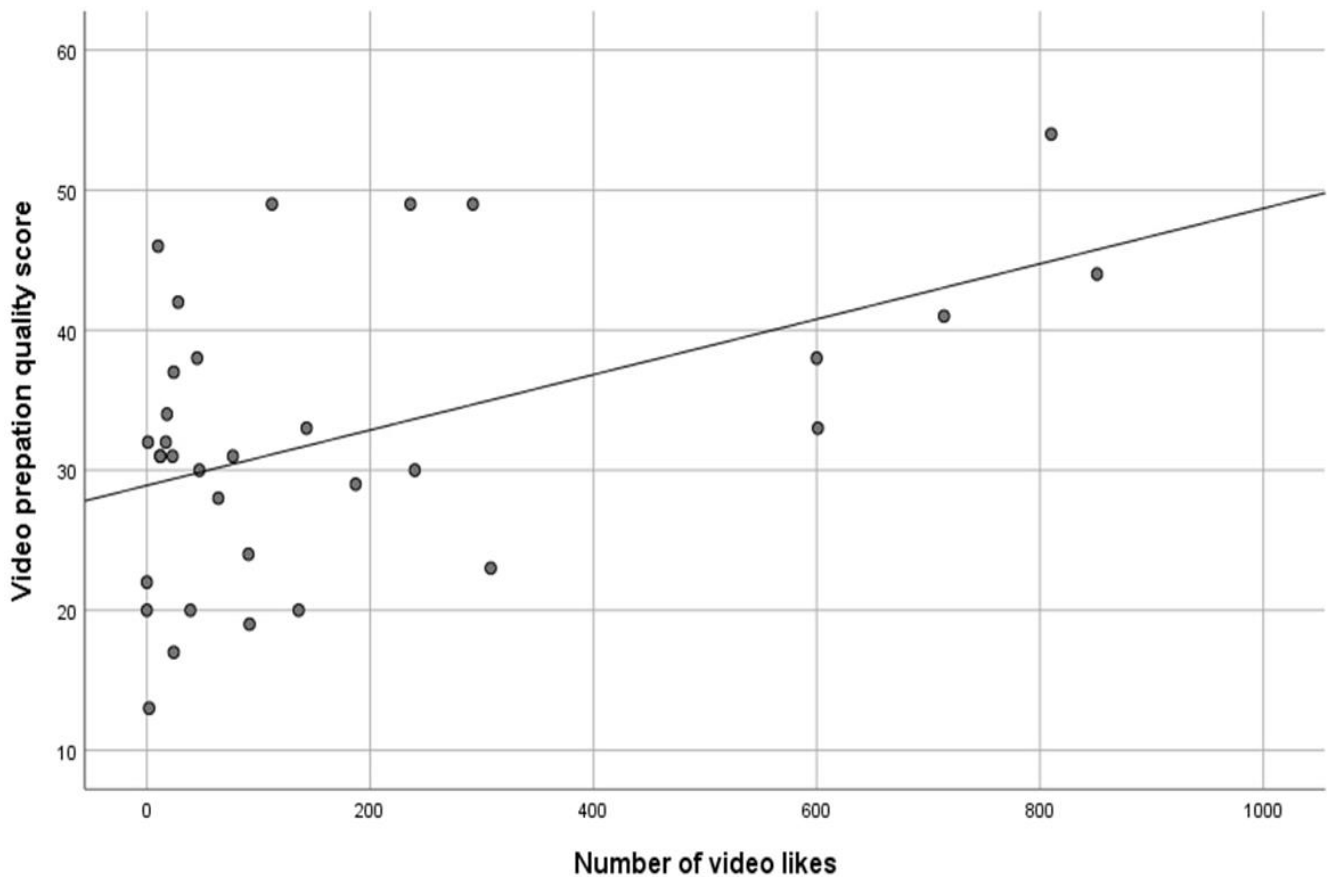


Fig. 4. Relationship between video preparation quality score and number of video likes.

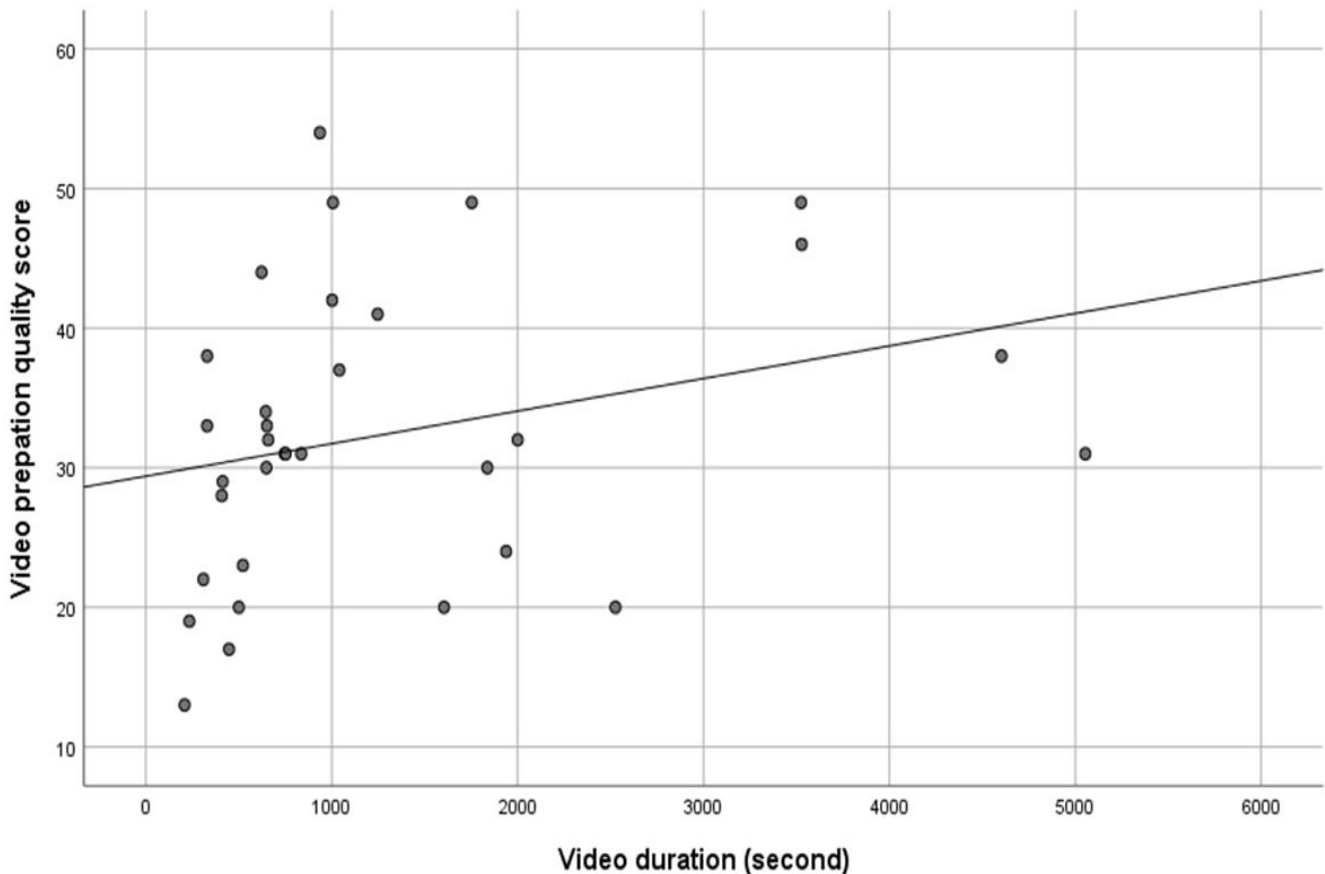


Fig. 5. Relationship between video preparation quality score and video duration.

#### 4. Discussion

In our research conducted by using the descriptive term 'paravertebral block ultrasound', we found that only 33% of the videos met the appropriate criteria for paravertebral block education. Among these videos, merely 6 (18.2%) demonstrated good educational quality, and the same 6 (18.2%) were also well-prepared. Physicians generally watch and apply visually educational videos on video platforms such as YouTube, in addition to textbooks, to contribute to their education. Therefore, it is important to examine the videos on these video platforms. Some studies have evaluated educational videos on YouTube [16]. There are also studies evaluating videos about interfascial plane blocks [9,12].

Our study is the first to examine and evaluate the quality of paravertebral block videos on YouTube. The paravertebral block is a block usually performed in thoracic surgeries that has a risk of pneumothorax due to its proximity to the pleura, a risk of intravascular injection due to its proximity to vascular structures, a risk of spreading to the cerebrospinal fluid (CSF) due to its proximity to the spinal cord, and a high risk of local anesthetic toxicity [15,18,19]. These reasons led us to evaluate the quality of paravertebral block videos on YouTube. Most of the studies have reported that the content and preparation of the videos on YouTube are poor and contain incorrect information that may endanger human health [20,21].

In our study, there were no videos that received perfect scores in either of the surveys we conducted. There

are only 6 videos that received good scores in surveys 1 and 2. While there are 15 videos with bad and very bad scores in Survey 1, there are 9 videos with bad and very bad scores in Survey 2. From the 12th question in Survey 1 (Was the sterile technique clearly explained or emphasized?) 29 videos received very poor scores. From the 13th question in Survey 1 (Was the information about the local anesthetic substance clearly explained?), 20 videos received very bad scores. From the 10th question in Survey 2 (Is information about the production or release date, producers, and references clearly explained?) 19 videos received very bad scores. From the 12th question in Survey 2 (Does the video contain additional aids such as stop and discuss points, scenarios, and/or summary information about the procedure?) 18 videos received very poor scores. From question 13 in Survey 2 (Was information provided about a way to evaluate the effectiveness and repeatability of the video?) 32 videos received very poor scores.

The videos on YouTube that we evaluated were inadequate in terms of education and preparation quality. Producers who create videos must comply with production standards and create accurate and high-quality content, and platforms must improve their content quality monitoring processes. Our work may be an incentive for content providers to provide feedback and create better content. Some studies similar to ours have reported that the quality of medical procedures in YouTube videos is low [10,16]. Our study shows that video quality is generally low. We could not see any officially false information in our study. However, the quality of some videos was so

low that they could be misunderstood by physicians who do not have enough knowledge about regional anesthesia and are just starting to practice, especially due to low-quality ultrasound images, insufficient information content, weak or missing audio comments, very poor sterility, and inadequate technique.

We found a significant correlation between the duration of the videos and the quality of the videos, and we also found a significant correlation between survey 1 and survey 2. As the educational content of the videos increases, the quality of their preparation also increases. We found a significant correlation between the number of likes and the quality of the videos, but, similar to other studies, we did not find a significant correlation between the number of views of the videos and the quality of the educational content of the videos [10,22]. This shows, as in other studies, that a similar number of viewers can watch low-quality videos and high-quality videos, and that the increase in the number of likes may mislead us. What should happen is that as the number of views increases, the video quality increases. However, our analysis shows that physicians who want to access information from videos on YouTube can access low and high-quality videos at the same rate and may be exposed to incorrect information.

#### 4.1. Limitations

We were able to review a limited number of videos. We reviewed videos on a specific topic, paravertebral block, and most videos did not meet the inclusion criteria. If we analyzed more videos, the result would be different. In addition, we only analyzed the videos on YouTube. We know that there are video-sharing platforms other than YouTube that contain educational videos. The subjective nature of video evaluation by two anesthesiologists may introduce bias. The study would benefit from a larger and more diverse group of evaluators.

#### 5. Conclusions

Paravertebral block, included in the final stages of anesthesiology speciality training programs, is a complex and experienced regional procedure. It is not possible to learn such a complex and advanced process with videos alone; therefore, a clinical approach and experience are required. Although many physicians use social media platforms for learning purposes and clinical experience, our study shows that these platforms must provide more educational value for the paravertebral block. For these reasons, we recommend that anesthesia societies inspect these videos and prepare them according to the guidelines.

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#### Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this manuscript.

#### Author Contributions

All of the authors made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; were involved in drafting the manuscript or revising it critically for important intellectual content; and gave final approval of the version to be published.

#### Data Availability

The datasets created and/or analyzed during the current study are not publicly available, but are available from the corresponding author upon reasonable request.

#### Ethics Approval and Consent to Participate

None declared.

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