

## ORIGINAL ARTICLE

# Quality, reliability, and content of YouTube videos in Portuguese language about dental trauma

## Qualidade, confiabilidade e conteúdo de vídeos do Youtube na língua Portuguesa sobre traumatismo dentário

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**ABSTRACT**

**Objective:** To evaluate the quality, reliability and content of YouTube videos in Portuguese about dental trauma. **Method:** An infodemiological study was developed in which the first 60 videos found on YouTube with the terms “dental traumatism”, “dental trauma” and “broken tooth” were analyzed. Repeated videos, longer than one hour, in a language other than Portuguese, not intended for the lay public, resolution of questions, songs, interviews, shorts, and other subjects were excluded. The content of the videos was rated using a 23-point scale that classified them into low, moderate, and high content. Reliability was assessed using the modified DISCERN scale and the overall quality was assessed using the Global Quality Score (GQS) scale. The numbers of likes, dislikes, comments and engagement were also accounted. Data were analyzed by Mann-Whitney and Spearman's correlation test ( $\alpha= 5\%$ ). **Result:** A total of 55 videos were included in the study. Most were posted by healthcare professionals (92.7%) and just over half (63.7%) were of good overall quality. There were moderate, positive, and statistically significant correlations between DISCERN and GQS scores ( $r=0.454$ ), duration ( $r=0.575$ ), and trauma content ( $r=0.510$ ). Overall quality correlated moderately, positively, and significantly with content scores ( $r=0.604$ ) and video length ( $r=0.467$ ). **Conclusion:** A significant proportion of Portuguese videos on YouTube about dental trauma had low content, quality and reliability information.

**RESUMO**

**Objetivo:** Avaliar a qualidade, a confiabilidade e o conteúdo de vídeos do YouTube na língua portuguesa sobre traumatismo dentário. **Método:** Um estudo infodemiológico foi desenvolvido a partir de uma busca no YouTube e os 60 primeiros vídeos encontrados com cada um dos termos “traumatismo dentário”, “trauma dental” e “dente quebrado” foram analisados. Vídeos repetidos, com mais de uma hora de duração, em outro idioma, não destinados ao público leigo, resolução de questões, músicas, entrevistas,

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shorts, e vídeos sobre outras temáticas foram excluídos. O conteúdo dos vídeos foi avaliado usando uma escala de 23 pontos que os classificou em baixo, moderado e alto conteúdo. A confiabilidade foi avaliada utilizando a escala DISCERN modificada e a qualidade geral foi avaliada com a escala *Global Quality Score* (GQS). Também foram contabilizados os números de curtidas, *dislikes*, comentários e engajamento. Os dados foram analisados pelos testes de Mann-Whitney e correlação de Spearman ( $\alpha = 5\%$ ). **Resultado:** 55 vídeos foram incluídos no estudo. A maioria foi postada por profissionais de saúde (92,7%) e pouco mais da metade (63,7%) foi de qualidade geral boa. Houve uma correlação moderada, positiva e estatisticamente significativa entre os escores do DISCERN e do GQS ( $r = 0,454$ ), duração ( $r = 0,575$ ) e conteúdo de trauma ( $r = 0,510$ ). A qualidade geral se correlacionou de forma moderada, positiva e significativa com os escores de conteúdo ( $r = 0,604$ ) e com a duração do vídeo ( $r = 0,467$ ). **Conclusão:** Uma proporção de vídeos em Português presentes no YouTube sobre traumatismo dentário possui informações de baixo conteúdo, qualidade e confiabilidade.

## INTRODUCTION

Dental trauma is an injury caused by an impact on the teeth and/or their supporting tissues. It is considered an unexpected and accidental event that in most cases requires emergency attention<sup>1</sup>. Dental traumas are highly prevalent in children and young adults. It is estimated that about a quarter of school-aged children and a third of adults have had an injury of this nature in the permanent dentition<sup>2,3</sup>. This situation is therefore a global public health issue, as it negatively impacts quality of life<sup>1,2</sup>.

The Internet has become one of the most important sources of information in the world, with approximately half of the global population having access to it. In most industrialized countries this number reaches 90%<sup>4</sup>. When it comes to accessing health information, data coming through the Internet surpasses sources like television, radio, and press professionals<sup>5</sup>.

The relentless pursuit of online access to health information has a serious consequence: self-diagnosis, a phenomenon that is growing every day and is fueled by the wide availability of information. The Internet is the primary source of health information for many people, preceding the search for professional help<sup>6</sup>.

YouTube is one of the largest media sharing platforms in the world, and the most sought source for obtaining health information. According to internet traffic data, this has been the second most visited website in the world since April 2017, surpassed only by Google<sup>5,7</sup>. YouTube has proven to be a valuable source of information about many diseases<sup>8</sup>, however, as the internet allows for easy access and uploading of any content, inaccurate or misleading information may be available. Seeing this, there is a concern in evaluating the quality and accuracy of the information available on this platform<sup>9,10</sup>.

Some studies analyzed the content of YouTube videos on health topics, such as tooth avulsion<sup>11</sup>, cleft lip and palate<sup>10</sup>, halitosis and dental prosthesis care<sup>12</sup>, to evaluate the effectiveness and reliability of the information made available to users. So far, only one study has assessed the reliability of YouTube videos on dental trauma and classified most of them as unsatisfactory in content. However, the cited study evaluated videos in English<sup>13</sup>. The aim of this study is to assess the quality, reliability, and content of information presented on videos in Portuguese.

## METHODS

### Study design

An observational and infodemiological study was carried out through the analysis of videos about dental trauma available on the YouTube platform.

### Search and video selection strategy

The three most used terms in searches for dental trauma were identified (dental trauma, tooth trauma, and broken tooth) through the Google Trends search tool<sup>14</sup>, which shows the most searched terms in recent past. In July 2023 a search was conducted on YouTube, with the assistance of a browser extension (*Return YouTube dislike*), using the terms found individually, and the first 60 videos listed with each keyword were evaluated. Repeated videos, those which lasted over an hour, those which were in languages other than Portuguese, or were not intended for lay audiences, featuring question resolution, music, interviews, shorts, and covering other topics, were excluded from the search<sup>15</sup>.

### Calibration

Before starting data collection, two researchers were subjected to a calibration exercise. The calibration was coordinated by a researcher with experience in the area and involved a theoretical and a practical moment. In the theoretical phase, the scales used for data collection were presented. In the practical phase, the researchers and the coordinator (gold standard) assessed 30 videos on the subject. The videos evaluated in this stage of the research were randomly selected from the fifth page (one hundredth video) of search results and were not included in the main study sample. After one week, the researchers reevaluated the same videos. The Kappa statistic was used to calculate the agreement between the researchers and the gold standard (inter-rater agreement) and between the assessments (intra-rater agreement). Kappa values above 0.80 were obtained, which are considered acceptable<sup>16</sup>.

### Data collection

The videos were independently analyzed by two previously calibrated researchers. In case of disagreements, a third researcher (gold standard) made the final decision.

A Microsoft Excel spreadsheet was created to record the following variables: number of likes, dislikes and comments, video (or videos) duration, engagement [(no. of likes - no of dislikes) / total views x 100%], Video source (official institutions, healthcare professionals, and others), audiovisual quality (low, medium, or high), content (low, moderate, and high), reliability, and overall quality<sup>11,13</sup>.

#### *Assessment of content, reliability, general quality and audiovisual quality*

The content of the videos was evaluated by assigning a score of 1 if any relevant topic about dental trauma was mentioned (definition, etiology, symptom, classification, disadvantages, indications, contraindications, procedures involved, prognosis and survival, complications, costs, deciduous or permanent tooth, intrusion, extrusion, subluxation, lateral luxation, avulsion, alveolar fracture, medication, replantation, splinting, surgical treatment, and endodontic treatment), totaling 23 descriptions; and 0 if it was not mentioned. Each video received a total score between 0 to 23 according to the number of items evaluated. The videos were then ranked based on the completeness of content as: low (0 to 7 points), moderate (8 to 15 points), and high (16 to 23 points)<sup>13</sup>.

Reliability concerns the ability of an instrument to display a result consistently, or the extent to which an instrument remains free from standard error<sup>17</sup>. In this study, the reliability of the videos was assessed using the modified DISCERN scale, consisting of five items that evaluate aspects such as clarity of objectives, use of reliable sources of information, impartiality of information, presentation of additional sources of information, and acknowledgment of areas of uncertainty about the subject. Each item has a response option of 'yes' (one point) or 'no' (no points). The total score for each video could range from 0 to 5, where higher values indicate greater reliability<sup>18,19</sup>.

The overall quality of the video was evaluated using the scale *Global Quality Score* (GQS) which assigns a score ranging from 1 to 5 (GQS: 1 = poor quality/not useful for the patient; 2 = Overall poor quality and poor flow/limited use for patients; 3 = Moderate quality and flow less than ideal/somewhat useful for patients; 4 = Good quality and flow/ useful for patients; 5 = excellent quality/very useful for the patient). This score is related to the usefulness of the video for the patient, the way the information is transmitted and the flow (continuity) of the video<sup>20</sup>.

Regarding audiovisual quality, the videos were classified as good, moderate, or poor. Videos with sharp images, clear text, professional graphics, or clear effects, and no noise or audio interference, were classified as "good". Homemade videos with environmental interference such as car noises, background noises, and speeches difficult to understand were classified as "moderate". Videos with blurry, grainy, or hard-to-understand images were classified as "poor"<sup>10</sup>.

#### *Statistical analysis*

The data was analyzed using descriptive and inferential statistics. The descriptive analysis consisted of determining absolute and relative frequencies, and measures of central tendency and dispersion. The normality of quantitative variables was tested using the Shapiro-Wilker test.

The Spearman correlation test was used to investigate the correlation between quantitative variables. As the data showed non-normal distribution, the Mann-Whitney test was employed to compare the number of views, likes, dislikes, comments, and engagement between videos with overall low quality and moderate/good quality, as well as to compare the number of comments, video duration, and DISCERN score between videos produced by healthcare professionals and those not. All analyzes were conducted using the Statistical Package for the Social Sciences (SPSS for Windows, version 25.0, IBM Corp., Armonk, NY, USA) with a significance level of 5%.

#### *Ethical aspects*

According to item III, sole paragraph of article 1 of Resolution 510 of 2016 of the Brazilian National Health Council, information in the public domain do not require submission to an ethics committee.

## **RESULTS**

Out of the 180 videos assessed, 125 were excluded (40 due to irrelevant information for trauma, 25 were not intended for laypeople, 20 were duplicates, 19 were in another language, 11 were over an hour long, 5 had music, 3 were shorts, and 2 interviews). Fifty-five videos met the eligibility criteria and were included in the study. Average reliability, overall quality and content scores were 2.7 ( $\pm 0.8$ ), 3.6 ( $\pm 0.8$ ) and 6.5 ( $\pm 4.3$ ), respectively (Table 1).

Regarding completeness of information on dental trauma, the most mentioned topics were indications on how to proceed after the incident (n=43; 78.2%), avulsion (n=31; 56.4%), etiologic (n=28; 50.9%), differences between deciduous and permanent teeth (n=26; 47.3%) and dental reimplantation (n=23; 41.8%). Costs (n=1; 1.8%), surgical treatment (n=4; 7.3%) and contraindications (n=5; 9.1%) were the least mentioned subjects (Figure 1). Just over half of the videos (63.7%) were of good to excellent general quality. The majority were videos uploaded by health professionals (92.7%) and the most cited topic was guidance in cases of dental trauma (76.4%). The average number of views and likes was 11,364.9 ( $\pm 31,589.6$ ) and 268.2 ( $\pm 804.2$ ), respectively. Of the 23 relevant topics that were evaluated to understand the completeness of information about dental trauma, 36 (65.5%) videos were included in the low content group (Table 1).

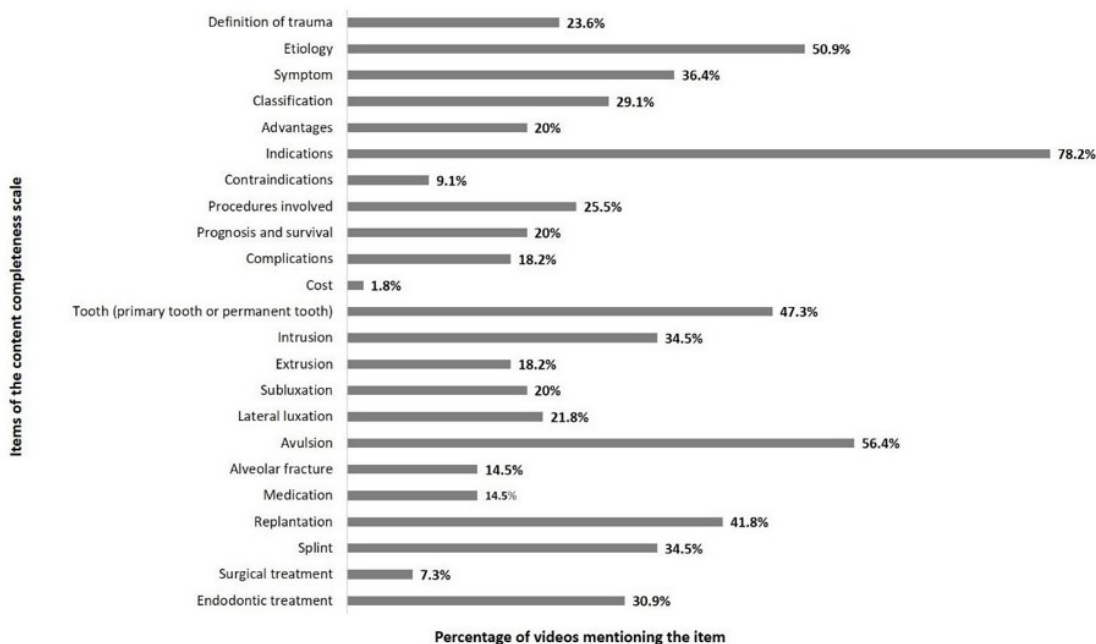
The duration, engagement, DISCERN score, and completeness of trauma content were significantly higher for high-quality videos when compared to low-quality videos (Table 2).

There was a moderate, positive, and statistically significant correlation between the DISCERN scores and the GQS scores, duration, and trauma content ( $p < 0.01$ ). There was a weak, positive, and statistically significant correlation between the DISCERN scores and engagement ( $p < 0.05$ ). Regarding the overall quality of the video, this variable was moderately, positively and significantly correlated with the trauma content and the length of the video ( $p < 0.01$ ). There was a weak, positive and significant correlation between the trauma content score and the number of likes and comments, as well as a moderate and positive correlation between the first and the duration of the videos (Table 3).

**Table 1** – Sample Characteristics (N=55).

Variable	N	%
Global Quality Score (GQS)		
2	6	10.9
3	14	25.5
4	31	56.4
5	4	7.3
Audiovisual quality		
Good	28	50.9
Moderate	27	49.1
Completeness of information		
Low (0-7 points)	36	65.5
Moderate (8-15 points)	17	30.9
High (16-23 points)	2	3.6
Video Source		
health professionals	51	92.7
Others	4	7.3
Theme		
Classification	7	12.7
Definition	4	7.3
Instructions	42	76.4
Treatment	2	3.6
Views	Average (DP)	Median (P <sub>25<sup>th</sup></sub> -P <sub>75<sup>th</sup></sub> )
Number of likes	11364.9 (31589.6)	1009 (163-4083)
Number of dislikes	268.2 (804.2)	26 (6-96)
Number of comments	8.3 (24.5)	0 (0-0)
Duration (seconds)	25.6 (80.2)	1 (0-7)
Engagement	513.7 (644.3)	313 (142-629)
DISCERN	0.04 (0.04)	0.02 (0.01-0.04)
GQS	2.7 (0.8)	3 (2-3)
CT	3.6 (0.8)	4 (3-4)
	6.5 (4.3)	5 (3-9)

DP: standard deviation. P<sub>25<sup>th</sup></sub>: 25<sup>th</sup> percentile. P<sub>75<sup>th</sup></sub>: 75<sup>th</sup> percentile.



**Figure 1** – Completeness of the videos regarding the contents covered on dental trauma.

**Table 2** – Association between general quality of videos and number of views, likes, dislikes, comments, duration, engagement, DISCERN score and CT score.

	General quality		p-value*
	Low	High	
	Median (P <sub>25</sub> <sup>†</sup> -P <sub>75</sub> <sup>‡</sup> )	Median (P <sub>25</sub> <sup>†</sup> -P <sub>75</sub> <sup>‡</sup> )	
Views	775.5 (119-12475.5)	1017 (174-2492.5)	0.79
Likes	8 (4.5-81.5)	32 (8-84)	0.33
Dislikes	0 (0-0)	0 (0-0)	0.79
Comments	0.5 (0-2.5)	1 (0-9.5)	0.41
Duration	144.5 (96.5-349.5)	391 (227.5-812.5)	0.002
Engagement	0.016 (0.007-0.036)	0.033 (0.024-0.046)	0.024
DISCERN	2 (2-3)	3 (3-3)	0.001
CT	3 (2-4)	7 (5-11.5)	<0.001

\*Mann-Whitney Test. P<sub>25</sub><sup>†</sup>: 25<sup>th</sup> percentile. P<sub>75</sub><sup>‡</sup>: 75<sup>th</sup> percentile.

**Table 3** – Bivariate correlation analysis between DISCERN scores, general quality scores (GQS), CT scores and number of views, likes, dislikes, comments, duration, engagement and videos views rate.

	DISCERN	GQS	CT	Views	Likes	Dislikes	Comments	Duration	View Rate	Engagement
DISCERN	1.000	0.454†	0.510†	0.089	0.242	0.238	0.193	0.575†	0.137	0.271*
GQS	0.454†	1.000	0.604†	-0.004	0.147	0.020	0.137	0.467†	-0.035	0.255
CT	0.510†	0.604†	1.000	0.156	0.283*	0.074	0.290	0.688†	0.209	0.209

\*p<0.05; †p<0.01.

## DISCUSSION

YouTube is one of the most visited websites in the world and hosts videos on various topics, in an accessible and free manner. The platform provides health information, however, there is no mechanism to control what is published, so the quality and accuracy of this material vary<sup>5,7,13</sup>. This study is the first to evaluate the quality and reliability of information provided on YouTube about dental trauma in the Portuguese language. The findings of the present study indicate that, in general, there is a limited number of videos with high quality, reliability and content on dental trauma available to patients and families.

Approximately two-thirds of the analyzed videos showed low completeness of information. With almost all videos uploaded by healthcare professionals, a higher proportion of high-quality videos was expected, since professional training allows for a more informed and comprehensive discussion of the subject. The findings of the present study are consistent with those of an investigation conducted with videos in the English language, which also concluded that videos with low content were more common than videos with high content<sup>13</sup>.

Regarding content, the videos could better address the differences that exist between the treatment of deciduous and permanent teeth. If a technique indicated only for permanent teeth is performed on a deciduous tooth (e.g., tooth reimplantation), damage to the permanent successor may occur<sup>21</sup>. Additionally, less than one-third of the evaluated videos classify the types of trauma, which is an important point to be improved in the material, since each type of trauma has a specific therapeutic approach<sup>2</sup>. The cost of treatment would be another point to enrich the videos. This topic may be of interest to the patient,

both for understanding the possible financial impact associated with dental trauma and from an emotional and socioeconomic perspective.

Our study found higher proportions of high-quality videos when compared to previous studies evaluating YouTube videos about diabetes<sup>22,23</sup>. However, in the present investigation more than a third of the videos had an overall quality of moderate to low, which represents limited or little useful use for patients. This result is worrying, as these videos can disseminate inaccurate and misleading information, which can generate negative consequences in the lives of those who watch and search for information on the subject. Considering that the videos included in this study were mostly uploaded by healthcare professionals, our findings also suggest a need for training among professionals in producing useful content about dental trauma for patients.

This paper confirmed that high-quality videos had significantly longer duration, engagement, reliability, and completeness score of trauma content. A study that evaluated videos in English about diabetes and oral health also found an association between overall quality and duration<sup>22</sup>. Indeed, longer duration allows for the inclusion of more content, which can favor the overall quality and reliability of the video, as these may be more useful to users and, consequently, increase engagement. The results of the correlations observed in this investigation also support this argument. However, it is important to highlight that content completeness is an indicator of the variety of information presented in the videos, not directly determining either the reliability or the quality of the information presented. In this sense, content completeness, overall quality, and reliability are distinct characteristics of the videos.

The average DISCERN score from our research was 2.7, indicating that the videos approached moderate reliability. The comparison of this result to that of the study which assessed videos in English is limited, as that paper did not evaluate reliability<sup>13</sup>. Of the five items that make up the DISCERN scale, the ones least addressed on the videos were the following: 'Are additional sources of information listed for the patient's reference?' and 'Are areas of uncertainty mentioned?'. Our findings indicate that the reliability of videos still needs to improve, especially about the inclusion of other sources of information and more in-depth discussion about the frontiers of knowledge on the subject.

It's important to note that the YouTube algorithm favors stable videos to be in the top positions of search results, implying that users accept these videos as a reliable source of information<sup>24,25</sup>. This may indicate that the results of this study are overestimating the quality of videos available on YouTube. Another limitation of this study is the fact that only videos in Portuguese were evaluated. However, it is estimated that there are around 142 million YouTube users in Brazil<sup>26</sup>, indicating that there is a significant audience potentially consuming these videos in Portuguese.

Understanding that dental trauma is the fifth most common teeth injury in the world<sup>27</sup>, it is important that people have access to accurate and true information on this topic. It is suggested that videos shared on YouTube be published after undergoing a system of approval and scientific control, to prevent misleading and low-quality information. Strategies such as fact-checking by experts, classification of sources of information received, and content flagging by platform owners are measures that have shown a positive effect on the quality of information disseminated on social media<sup>28,29</sup>. Additionally, YouTube has implemented mechanisms to avoid health misinformation and to increase the visibility of health information from official sources, such as providing information panels below videos, showing context about the source based on the principles of the National Academy of Medicine<sup>30</sup>.

## CONCLUSION

The results of this study show that there is a large quantity of videos available in Portuguese on YouTube containing dubious information regarding the reliability, quality and content of dental trauma.

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#### Individual contribution of the authors:

Study conception and design: MLSA, IMV, RTF

Data collection: MLSA, IMV

Data analysis and interpretation: MLSA, RTF

Manuscript writing: MLSA, IMV, RDADG

Critical review of the text: JPS, CACC, AFGG

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