

# Audiovisual information of oral epithelial dysplasia: Quality, understandability and actionability

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## Abstract

**Objectives:** Online information on oral epithelial dysplasia (OED) is insufficient and of low quality. While only written information has been previously assessed, this study aims to evaluate the content and quality of audiovisual (AV) online information about OED.

**Methods:** One hundred and twenty-seven materials were initially considered using six key words across two search engines (YouTube and Google). Ultimately, 29 materials remained for the final assessment. These materials were then analysed for content, quality (DISCERN instrument, JAMA benchmarks), understandability and actionability.

**Results:** Most contents were scientific ( $n=25$ ), while three videos were educational, and one video was a personal experience with OED. On a scale of 1–5, the overall DISCERN score was (mean  $\pm$  SD =  $2.26 \pm 0.79$ ), suggesting poor quality of information. Regarding JAMA benchmarks, there was no single material that fulfilled or lacked all four benchmarks. The overall mean understandability score was 82% and the actionability mean score was significantly low at 29%.

**Conclusion:** Although the vast majority of AV materials on OED were primarily produced for scientific purposes, these materials could be helpful as resources for patient education. Keeping in mind, however, that the desired quality and essential patient information about OED available online remains largely poor and missing.

## KEYWORDS

audiovisual health information, health education, mouth precancer education, oral epithelial dysplasia information, patient education, patient information

## 1 | INTRODUCTION

Oral epithelial dysplasia (OED) is a condition characterised by epithelial changes that have been associated with an elevated risk of progression to oral cancer (OC) (Tilakaratne et al., 2019). Some OED lesions or relevant conditions such as oral potentially malignant disorders (OPMDs) require life-long follow-up; thus, enhancing patient information and knowledge of these chronic and potentially carcinogenic conditions is key to achieving favourable long-term outcomes

(Iocca et al., 2020). The primary and most effective method in delivering the patient information needed is through conversations with patients during their clinic visits. However, online materials have also provided sources of patient-related health information (Radonjic et al., 2020; Wasserman et al., 2014).

Acquiring knowledge has never been simpler than in this modern era. Global communications and the spread of various types of information, including health-related information, have substantially evolved because of the Internet (Ayantunde et al., 2007). Since its

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introduction to the public in 1991, the Internet has gradually become an integral component of peoples' knowledge lives (Anderson & Klemm, 2008). Over the past three decades, not only has Internet activity surged but also the availability and mass of health-related information have also expanded. In 2000, more than 70,000 websites supplied health-related content (Grandinetti, 2000). Five years later, the word 'health' had been searched approximately 473,000,000 times (Ybarra & Suman, 2006).

People are driven to search for health information on the Internet to find reassuring answers, seek different views on medical treatments and further absorb clinically delivered information (Powell et al., 2011). While patient information websites of professional organisations continue to be the most trustworthy sources, the audiovisual (AV) contents offered by video streaming websites such as YouTube may be preferred over the information available on official or scientific websites owing to the popularity of YouTube and the strong cognitive and emotional effects of the videos on the site (Berk, 2009). However, patients seeking for reliable online information about OED and relevant OPMDs are unlikely to find it on various online platforms (Alsoghier et al., 2018; Wiriyakijja et al., 2016).

It is important to acknowledge that the distribution of online information is not restricted to academic or professional organisations; hence, publication of unreliable health information is highly possible. Therefore, previous web-based studies have highlighted that the quality and credibility of such materials must be questioned (Daraz et al., 2011; Eysenbach et al., 2002; Garfinkle et al., 2019; McGoldrick et al., 2017; Yeung et al., 2015). In addition, health literacy relies mainly on readability, but other factors, including understandability and actionability, are also cardinal. Health information seekers should be able to understand and convey knowledge and recognise the necessary activities after reading or watching a particular content (Shoemaker et al., 2014).

Online health-related information on OED is insufficient and of low quality (Alsoghier et al., 2018). While only written information of OED has been previously assessed, this study aims to evaluate the AV online information of OED. Websites that provide pertinent, correct and understandable content can be identified with the aid of validated assessment methods (Abdoun et al., 2020; Alsoghier et al., 2018).

## 2 | AIMS

To assess the content, quality, understandability and actionability of online AV information for individuals with OED.

## 3 | METHODS

### 3.1 | Search strategy

The search terms 'oral dysplasia', 'oral epithelial dysplasia', 'oral dysplasia patient information', 'oral premalignancy', 'mouth

pre malignancy' and 'mouth precancer' were typed into search engines (Google and YouTube). The video-only option was selected for the Google search. The data gathering period was between December 2022 and January 2023.

### 3.2 | Excluded and included AV materials

During the search phase, 127 AV materials were identified. After duplicates were removed ( $n=36$ ), the overall number decreased to 91. The inclusion criteria were as follows: materials that addressed OED and/or OPMDs and/or OC, with clear filming and sound. The following exclusion criteria were then applied: Materials that were not relevant to OED ( $n=49$ ), non-English or English mixed with another language ( $n=6$ ), required membership or subscription to access ( $n=6$ ) and low quality or less than 240p ( $n=1$ ). Finally, 29 videos remained for the final assessment (Figure 1).

### 3.3 | Content assessment

The selected videos were categorised according to the following criteria: Source, relevance, OED components, content type, origin or country of AV material, length of video and number of views and likes.

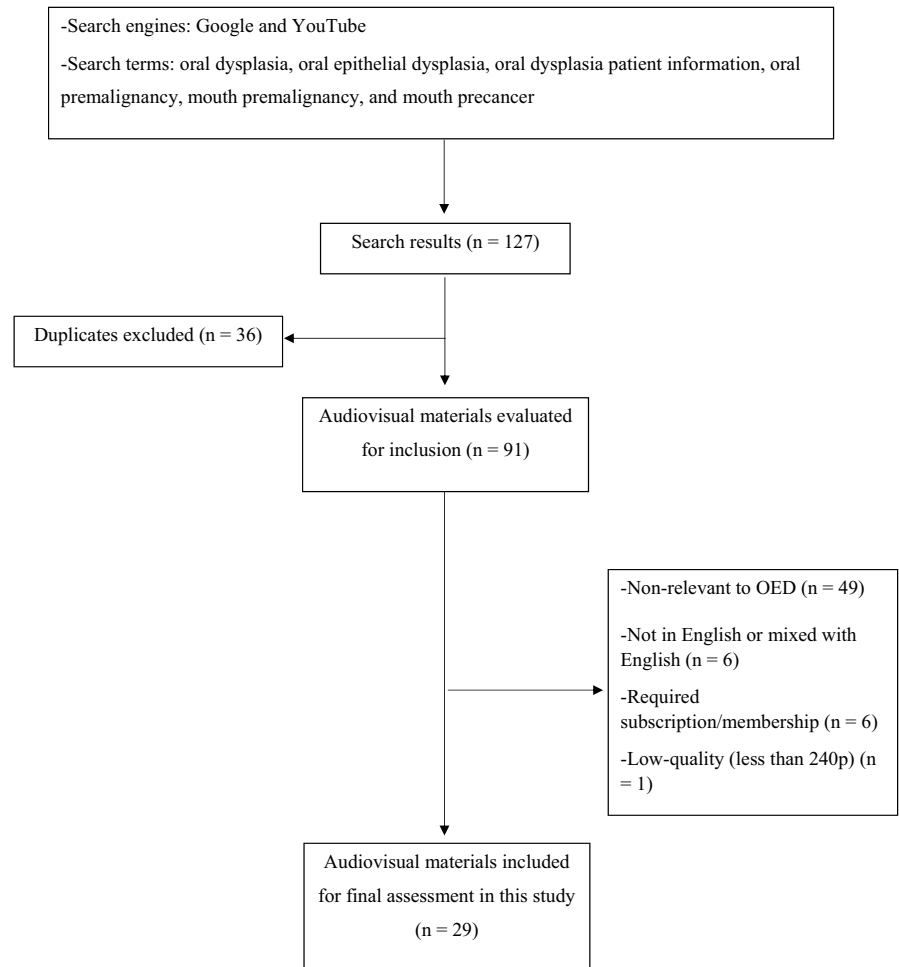
### 3.4 | Quality assessment

To assess the quality, accuracy and educational value of the AV materials, two reviewers (WA and SRP) performed evaluations independently using the following tools: the DISCERN instrument (Charnock et al., 1999) and *Journal of the American Medical Association* (JAMA) benchmarks (Silberg et al., 1997). DISCERN is widely regarded as the most important standardised quality index, as it enables healthcare professionals to objectively assess any given health information. This valid and reliable consists of a 16-item questionnaire divided into three sections: reliability (questions 1–8), treatment options (questions 9–15) and overall rating (question 16). Each item is given a 5-point rating (1=no, 2–4=partially and 5=yes).

The JAMA benchmarks are comprised of four criteria (authorship, attribution, disclosure and currency), and a 4-point scale is used to identify the quality of any selected material. An AV material scored a point if it met the benchmark elements, which encompassed the following: authorship (authors' names, credentials and affiliations), attribution (copyright, sources and references), disclosure (ownership acknowledgement, possible conflict of interest, funding and support, advertising and underwriting) and currency (dates and updates). In the final assessment, the scores of the chosen materials ranged from 0 to 4.



**FIGURE 1** Flow diagram of the eligibility of the chosen 29 audiovisual materials.



### 3.5 | Understandability and actionability assessment

To assess the understandability and actionability of the information provided in the AV materials, the same reviewers (WA and SRP) used the valid and reliable Patient Education Material Assessment Tool (PEMAT) for AV materials (PEMAT-AV) (Shoemaker et al., 2014). This tool consists of 13 items on understandability that assess the ability of individuals to comprehend and acquire essential information and four items on actionability that assess the clarity of recommendations to facilitate user action. The understandability measure is divided into four domains: content (one item), word choice and style (three items), organisation (four items), layout and design (three items) and use of visual aids (two items). The answer options for each item are 'yes', 'no' and 'not applicable'. When a material meets 80% or more of the item, 'yes' is assigned as a response; otherwise, 'no' is given.

### 3.6 | Statistical analysis

To generate descriptive statistics, the data were collected using a proforma tailored to the study and exported to Microsoft Excel. IBM SPSS was used for variable representation (version 22.0).

### 3.7 | Ethical consideration

This study does not require ethical approval.

## 4 | RESULTS

### 4.1 | General characteristics of the AV materials

The sources of the 29 final AV clips were classified in our analysis into three categories, namely scientific, educational and personal experience. Most contents were scientific produced by professionals ( $n=25$ ; 86%) affiliated with universities or medical centres, or who were independent. This scientific content was presented as scientific lectures ( $n=13$ ), narrated slides and graphics ( $n=9$ ), online webinars ( $n=2$ ) and one clip was a non-sound slide and graphic presentation. The educational contents included three videos (10%), presented as short clips of facts delivered by an expert ( $n=2$ ) and one narrated slide and graphic clip. The presenters of the educational contents had various backgrounds and affiliations, including medical centres, profitable online course providers and independent practice. One individual shared his personal experience with OED through a vlog on YouTube.

Regarding the relevance of the contents to OED, six videos addressed OED only, two videos addressed both OED and OPMDs,

one video outlined both OED and OC and eight materials highlighted OED, OPMDs and OC. However, 12 videos did not primarily address OED and focused on OPMDs or OC. For the clips that covered OED ( $n=17$ ), the definition, WHO criteria and grading were mentioned together in seven videos, while three videos highlighted the definition and WHO criteria. The grading only was discussed in two videos and the definition only was provided in one video. Diagnostic methods and progression risk were outlined in two clips, whereas the various treatment options were mentioned in one clip only.

Most of the materials ( $n=25$ ) were presented on YouTube, while only four were found on other websites. Approximately, half of the contents ( $n=14$ ) originated from India; six from the United States and two from Malaysia. One video was produced from the following countries: the United Kingdom, Singapore, Iran, South Africa and Guatemala. The origin of the content was not identified in two clips. The recorded dates of the materials ranged from 2012 to 2022, with year 2022 having the most published materials ( $n=8$ ), followed by 2020 ( $n=6$ ) and 2021 ( $n=4$ ).

The durations of the AV presentations ranged from 36s to 110min 12s. Fourteen materials were  $\leq 10$ min long, seven ranged from 10 to 30min long and eight were  $> 30$ min long. The number of views ranged from 25 to 71,034, of which 14 videos had been viewed  $\leq 1000$  times, nine videos had been viewed between 1001 and 10,000 times and three materials had  $> 10,000$  views. The total number of likes ranged from 0 to 1000. However, most clips ( $n=22$ ) received  $\leq 100$  likes, whereas three videos had  $> 100$  likes, and one presentation only had 1000 likes. Table 1 summarises the general characteristics of the 29 selected informative materials.

## 4.2 | Quality assessment

### 4.2.1 | DISCERN

Table 2 provides a summary of the DISCERN scores of the 29 chosen AV materials. The mean  $\pm$  SD overall rating was  $2.26 \pm 0.79$ , with none of the materials achieving the maximum rating of 5 and with 16 AV materials (55%) obtaining the minimum overall rating. The highest mean scores correlated with the following items: (Q5) explicit date (4.72), (Q6) balanced and unbiased (4.24) and (Q3) relevance (3.68). More than half (60%) of the items obtained mean scores  $< 2$ , encompassing (Q7) additional sources (1.68), (Q8) areas of uncertainty (1.86), (Q9) how treatment works (1.82), (Q10) benefits of treatment (1.65), (Q11) risks of treatment (1.34), (Q12) effects of no treatment (1.55), (Q13) effects on quality of life (1.34), (Q14) all treatments described (1.48) and (Q15) shared decision (1.62).

### 4.2.2 | JAMA criteria

Most AV materials ( $n=28$ ; 96.55%) compiled the currency standard, of which less than half ( $n=12$ ; 41%) met the authorship benchmark.

Attribution and disclosure were met by six (20.68%) and three materials (10.34%) respectively. Regarding the total number of benchmarks reached, no single material fulfilled or lacked all four benchmarks, five AV materials (17.24%) met three benchmarks, 10 materials (34.48%) met two benchmarks and 14 materials (48.27%) met one benchmark (Table 3).

## 4.3 | Understandability and actionability assessment

The mean PEMAT-AV understandability score of the 29 AV materials ranged from 25% to 100%, with an overall mean  $\pm$  SD of  $82\% \pm 0.25\%$ . The actionability values ranged from 0% to 100%, with a mean  $\pm$  SD score of  $29\% \pm 0.4\%$ . Items 1–13 assessed understandability, whereas items 14–17 assessed actionability. In regard to understandability, five AV materials received scores  $> 90\%$ , including item 4, 'The material uses the active voice' (93%); item 9, 'The material uses visual cues (e.g. arrows, boxes, bullets, bold, larger font, and highlighting) to draw attention to key points' (91.3%); item 11, 'The material allows the user to hear the words clearly (e.g. not too fast and not garbled)' (96%); item 12, 'The material uses illustrations and photographs that are clear and uncluttered (91.66%)'; and item 13, 'The material uses simple tables with short and clear row and column headings' (100%) (Table 4).

In terms of actionability, item 14, 'The material clearly indicates at least one action the user can take', received the highest rating (37.93%), whereas item 17, 'The material explains how to use the charts, graphs, tables, or diagrams to take actions', received the lowest rating (4.76%) but was not applicable among eight AV materials. Eighteen materials all had a 0 actionability score (Table 5).

## 5 | DISCUSSION

Numerous research studies have addressed AV contents and oral health, but this is the first study to examine the content and quality of AV materials on OED. Evidence demonstrates that YouTube has been used as a source of information for diverse oral medicine subjects such as oral cancer (Hassona et al., 2016), Sjogren's syndrome (Delli et al., 2016), oral thrush (Di Stasio, Romano, Paparella, Gentile, Minervini, et al., 2018), mouth sores (Di Stasio, Romano, Paparella, Gentile, Serpico, et al., 2018), oral leukoplakia (Kovalski et al., 2019), burning mouth syndrome (Fortuna et al., 2019), oral halitosis (Ramadhani et al., 2021) and oral lichen planus (OLP) (Romano et al., 2021). Table 6 summarises the research conducted on the quality of AV online information on several oral diseases.

A relevant previous study that evaluated the quality of written web-based information on OED by Alsoghier et al. (2018) highlighted that OED-related content was scarce and of poor quality and that further work is necessary to create trustworthy online resources for patients with OED. However, given that the AV materials of OED was never scrutinised, this study aims to provide an analysis of the



TABLE 1 Descriptive features of the selected audiovisual materials.

Category	Criteria	Number of videos	
Source	Professional (university, medical centres and independent)	Scientific lecture	13
		Online webinar	2
		Narrated slides and graphics	9
		Slides and graphics without audio	1
	Educational (medical centres, profitable organisations and independent)	Short clip facts by an expert	2
		Narrated slides and graphics	1
	Personal experience	Human story vlog	1
Other	Government, commercial and unclassified	0	
Relevance	Video addresses OED only	6	
	Video addresses OED and OPMDs	2	
	Video addresses OED and OC	1	
	Video addresses OED, OMPDs and OC	8	
	Video does not primarily address OED	12	
OED components	Definition only	1	
	Grading only	2	
	Definition and WHO criteria	3	
	Definition, WHO criteria and grading	7	
	Definition, WHO criteria, grading and diagnosis	1	
	Definition, grading, diagnosis and treatment	1	
	Definition, WHO criteria, grading and prognosis in terms of 'progression risk'	2	
	Impact on QoL and recommendations	0	
None	12		
Media platform	YouTube	25	
	Non-YouTube	4	
Country	United Kingdom	1	
	United States	6	
	India	14	
	Malaysia	2	
	Iran	1	
	Singapore	1	
	South Africa	1	
	Guatemala	1	
	Unknown	2	
Published since (years)	2022	8	
	2021	4	
	2020	6	
	2019	2	
	2018	2	
	2017	3	
	2015	1	
	2012	2	
	Unknown	1	

(Continues)

TABLE 1 (Continued)

Category	Criteria	Number of videos
Duration (min)	≤10	14
	Between 10 and 30	7
	>30	8
Number of views	≤1000	14
	Between 1000 and 10,000	10
	>10,000	3
	Unknown	2
Number of likes	≤100	22
	>100	3
	>1000	1
	Unknown	3

Abbreviations: OC, oral cancer; OED, oral epithelial dysplasia; OPMDs, oral potentially malignant disorders; QoL, quality of life; WHO, World Health Organization.

TABLE 2 Mean DISCERN scores of the selected audiovisual materials.

Domain	DISCERN question	Mean ± SD
Reliability	Q1. Explicit aims	2.57 ± 1.84
	Q2. Attainment of aims	2.82 ± 2.00
	Q3. Relevance	3.68 ± 1.46
	Q4. Explicit sources	2.06 ± 1.7
	Q5. Explicit date	4.72 ± 1.03
	Q6. Balanced and unbiased	4.24 ± 1.35
	Q7. Additional sources	1.68 ± 1.53
Treatment options	Q8. Areas of uncertainty	1.86 ± 1.18
	Q9. How treatment works	1.82 ± 1.19
	Q10. Benefits of treatment	1.65 ± 1.14
	Q11. Risks of treatment	1.34 ± 1.07
	Q12. Effects of no treatment	1.55 ± 1.15
	Q13. Effects on quality of life	1.34 ± 1.07
	Q14. All treatments described	1.48 ± 1.12
	Q15. Shared decision	1.62 ± 1.42
Overall rating		2.26 ± 0.79

present online content. After searching on search engines using multiple phrases, we involved materials from multiple sources, including academic institutes, medical centres, scientific lectures, medical or dental YouTube channels and personal experiences, which ultimately led to the analysis of 29 items created over a 10-year period.

While healthcare centres and providers are increasingly using online patient education, our findings demonstrate a paucity of good-quality AV health information addressing oral diseases such as OED. To the best of our knowledge, no previous study has classified the content and evaluated the quality, understandability and actionability of AV online information concerning OED.

TABLE 3 Numbers and percentages of the selected audiovisual (AV) materials that achieved the JAMA benchmarks.

JAMA benchmark	Number of AV materials	Percentage (%)
Authorship	12	41
Attribution	6	20.68
Disclosure	3	10.34
Currency	28	96.55

## 5.1 | General characteristics of AV materials on OED

In this present analysis, most AV materials ( $n=25$ ; 86%) were found on YouTube, which could be explained by the popularity, easy accessibility and lack of strict peer review process prior to publishing any content on this platform (Ho et al., 2017). Consequently, the patient information found on YouTube is likely insufficient, inaccurate and unreliable but still popular among users, as indicated by Kanlioz and Ekici (2020).

Although contents produced by university channels and professional groups were superior in terms of both quality and credibility (Delli et al., 2016), studies have demonstrated that the origin of an AV material does not always necessarily indicate its quality and that AV clips containing personal or family experiences can deliver high-quality health information (Angulo-Jiménez & Dethorne, 2019). A previous study revealed that patient experience content composed most of the available AV contents on certain conditions such as Bechet's disease (Karakoyun & Yildirim, 2021). Our study included a vlog on the story of a patient who had OED, in which a clip exhibited good quality information about OED; in fact, it was the only AV material that pointed out the different treatment options for OED and addressed essential aspects such as the nature of the disease,

**TABLE 4** Numbers of audiovisual (AV) materials that satisfied the Patient Education Materials Assessment Tool (PEMAT) items for understandability assessment.

Domain	PEMAT item	Number of AV materials that met the item, n (%)
Content	1. The material makes its purpose completely evident.	18 (62)
Word choice and style	2. The material uses common, everyday language.	26 (89.65)
	3. Medical terms are used only to familiarise the audience with the terms. When used, medical terms are defined.	25 (86.2)
	4. The material uses the active voice.	27 (93)
Organisation	5. The material breaks or 'chunks' information into short sections.	19 (86.36) <sup>a</sup> 5 NA
	6. The material's sections have informative headers.	19 (86.36) <sup>a</sup> 5 NA
	7. The material presents information in a logical sequence.	25 (86.20)
	8. The material provides a summary.	57.14% <sup>a</sup> 1 NA
Layout and design	9. The material uses visual cues (e.g. arrows, boxes, bullets, bold, larger font or highlighting) to draw attention to key points.	91.3% <sup>a</sup> 6 NA
	10. The text on the screen is easy to read.	86.95% <sup>a</sup> 6 NA
	11. The material allows the user to hear the words clearly (e.g. not too fast and not garbled).	96% <sup>a</sup> 4 NA
Use of visual aids	12. The material uses clear and uncluttered illustrations and photographs.	91.66% <sup>a</sup> 5 NA
	13. The material uses simple tables with short and clear row and column headings.	100% <sup>a</sup> 16 NA

<sup>a</sup>Number of AV materials not applicable for certain understandability items.

diagnostic procedure and postoperative phase in a simple and understandable approach.

As most of the included AV clips originated from dental professionals ( $n=25$ ; 86%), their contents were predominantly scientific, targeting the education of high-end professionals rather than

**TABLE 5** Numbers of audiovisual (AV) materials that satisfied the Patient Education Materials Assessment Tool (PEMAT) items for actionability assessment.

Domain	PEMAT item	Number of AV materials that met the item (%)
Actionability	14. The material clearly identifies at least one action the user can take.	11 (37.93%)
	15. The material addresses the user directly when describing actions.	8 (27.58%)
	16. The material breaks down any action into manageable, explicit steps.	6 (20.68%)
	17. The material explains how to use the charts, graphs, tables or diagrams to take actions.	1 (4.76%) <sup>a</sup> 8 NA

<sup>a</sup>Number of AV materials not applicable for certain actionability items.

patients or lay persons. Whereas the educational content was considerably lacking, as there were only three materials (10%) that were generated for patient education purposes. We believe that this small number is worrying, and academic institutes and professional individuals must also consider patient-centred information production rather than largely focusing on high-end directed content. However, this trend was demonstrated in a study by Fortuna et al. (2019), who showed that educational content predominantly (46%) represented AV health information about burning mouth syndrome.

Although the advanced information from the scientific content may be suitable for professionals or intended for gaining personal recognition, Cuddy (2010) outlined that the public could also benefit from this reliable information. In our study, we observed that most contents exhibited scientific information that primarily covered the OED definition and diagnosis and clinical presentations of OPMDs. This information could be useful for promoting overall patient awareness but does not truly shed light on other essential elements such as early detection, decision-making, diagnostic procedures, treatment options, potential complications and impact on quality of life.

## 5.2 | The quality of online AV OED materials

The assessment of AV content using the DISCERN and JAMA tools revealed that most materials had poor quality. Though using different

TABLE 6 Summary of research conducted of audiovisual patient information materials on various oral diseases.

Author (year)	Disease	Number of included materials	Quality assessment tools	Major findings
Hassona et al. (2016)	Oral cancer	188	Usefulness score	<ul style="list-style-type: none"> <li>Academic institutes and personal story publication are more useful than individual user materials.</li> </ul>
Delli et al. (2016)	Sjogren's syndrome	70	Global Quality Scale and modified DISCERN	<ul style="list-style-type: none"> <li>Half of the videos were classified as useful; less than half, as personal experience; and the rest, as misleading.</li> <li>Personal content was preferred over educational content.</li> </ul>
Di Stasio, Romano, Paparella, Gentile, Minervini, et al. (2018)	Oral thrush in children	29	Unidentified	<ul style="list-style-type: none"> <li>About two thirds of the evaluated contents were slightly useful.</li> <li>In spite of the source, information about mouth sores in children on YouTube was poor.</li> </ul>
Di Stasio, Romano, Paparella, Gentile, Serpico, et al. (2018)	Mouth sores in children	33	Unidentified	<ul style="list-style-type: none"> <li>The information on oral thrush from clips was of poor quality.</li> </ul>
Kovalski et al. (2019)	Oral leukoplakia	28	Global Quality Scale, usefulness score and modified DISCERN	<ul style="list-style-type: none"> <li>The analysis revealed that the videos were of poor quality, reliability and usefulness.</li> </ul>
Fortuna et al. (2019)	Burning mouth syndrome	114	Quality assessment score	<ul style="list-style-type: none"> <li>Approximately half of the contents were educational.</li> <li>However, the quality of the contents was poor.</li> </ul>
Ramadhani et al. (2021)	Halitosis	105	Global Quality Scale, comprehensive score and DISCERN	<ul style="list-style-type: none"> <li>Contents were mostly poor.</li> <li>Low-quality content was preferred over high-quality content.</li> </ul>
Romano et al. (2021)	Oral lichen planus	36	Global Quality Scale and DISCERN	<ul style="list-style-type: none"> <li>The materials mostly presented poor information despite the gradual improvement in content.</li> </ul>
Alamoudi et al. (this study)	Oral epithelial dysplasia	29	DISCERN, JAMA and PEMAT-AV	<ul style="list-style-type: none"> <li>Content is predominantly scientific, not educational.</li> </ul>

assessment tools, previous research studies have found that contents addressing various oral disorders had a similar poor quality of patient information, encompassing oral leukoplakia (Kovalski et al., 2019), burning mouth syndrome (Fortuna et al., 2019), oral halitosis (Ramadhani et al., 2021) and OLP (Romano et al., 2021) (Table 6).

Regarding the assessment using DISCERN, the mean  $\pm$ SD overall score (item 16) of the examined AV contents was  $2.26 \pm 0.79$  on a scale of 1–5, which suggests that the quality of the information was poor. This finding is consistent with that of a study by Romano et al. (2021) that used DISCERN to assess the quality of information concerning OLP, which indicated an overall mean average of  $2.33 \pm 1.07$ . Even though the following numbers were obtained from studies conducted on online information from written content, it would be helpful to report the findings given the relevance and similar results, and that include an overall DISCERN score of 2.55 for on oral cancer (Riordain & McCreary, 2009), 2.3 for oral leukoplakia (Wiriyakijja et al., 2016) and 2.24 for oral epithelial dysplasia (Alsoghier et al., 2018).

In our study, we found that all treatment related DISCERN questions were associated with the lowest scores. This observation

was also reported in previous studies by Alsoghier et al. (2018), Riordain and Hodgson (2014) and Wiriyakijja et al. (2016), where the lack of patient information on the different treatment options, risks of no treatment and potential adverse effects was evident. Physicians are currently shifting from the unidirectional concept of management to the shared treatment decision-making (Stairmand et al., 2015), which cannot be established without adequate and trustworthy information about all treatment details pertaining to OED.

This poor quality is represented by the findings on the JAMA benchmarks. No single AV content met all four JAMA benchmarks, raising a question regarding the reliability of the information offered by the 29 materials included in this study. This is comparable with research about the oral involvement of scleroderma in which only 7% of the analysed information fulfilled the four benchmarks (Abdouh et al., 2020). Furthermore, the fact that content that does not satisfy at least three of the benchmarks could be suspicious (Silberg et al., 1997), and only five materials (17.24%) in our analysis achieved this standard emphasises the overall poor sufficiency and reliability of the information displayed on the examined video clips. This



finding is also compatible with a study conducted on written OED information that indicated that 80% of online information could be classified as suspicious (Alsoghier et al., 2018).

### 5.3 | The understandability and actionability of online AV materials on OED

The PEMAT evaluates patients' comprehension of health information (understandability) and if the information motivates users to do at least one action and breaks a recommended behaviour into phases (actionability) (Shoemaker et al., 2014). Even though both versions (PEMAT-P and PEMAT-AV) have demonstrated good inter-rater reliability, PEMAT has not been used in dentistry studies.

The overall mean understandability score of the selected materials was 82%, while the actionability mean score was significantly low at 29%. Although most of the examined clips (86%) were primarily scientific and only (10%) were educational, the level of understandability was good (82%), which could be attributed to the appealing nature of the AV content, organised and well-structured presentations, clear aims of the material and inclusion of pictures and graphs. However, this high understandability rating was not necessarily representative of the entire content because certain PEMAT items were not applicable to multiple AV materials, thus the high overall rating (e.g. item 13 was not applicable across 16 materials).

Many materials from the examined AV contents in our study ( $n=18$ ; 62%) had an actionability rating of 0%. This poor actionability result is worrisome because research suggests that actionability should be taken into account as a cornerstone when creating informational materials (Kang & Lee, 2019). However, five materials (17%) received an actionability rating of 100%, as they indicated key messages such as continued self-examination, seeking immediate care when concerning clinical changes occur, importance of long-term follow-up, impact on quality of life and avoiding risk factors and bad habits.

This analysis had several limitations, including the dynamic nature of the internet content, only videos provided in English were considered, the analysis chiefly focused on YouTube and did not include contents from other social media platforms and although an extensive search was conducted, the number of included AV materials was only 29, which is considered a small sample.

## 6 | CONCLUSIONS

This study shows that although the online AV materials on OED were primarily produced by dental professionals for scientific purposes, these materials could be helpful as resources for patient education. However, many clips did not satisfy the minimum criteria for providing high quality and comprehensive patient information.

Considering the tremendous reach of social media platforms and the need to disseminate accurate information regarding OED, it is necessary to create credible patient information resources and increase the professional presence on the different social media platforms. We also suggest that future research should consider using the DISCERN, JAMA and PEMAT instruments to evaluate additional educational AV contents in the field of oral diseases.

### AUTHOR CONTRIBUTIONS

**Waleed Alamoudi:** Conceptualization; writing – original draft; investigation; methodology; data curation; formal analysis. **Richeal Ni Riordain:** Conceptualization; investigation; writing – review and editing; methodology; project administration; supervision; resources. **Stefano Fedele:** Conceptualization; investigation; methodology; writing – review and editing; project administration; supervision; resources. **Stephen Porter:** Conceptualization; investigation; writing – original draft; writing – review and editing; methodology; project administration; supervision; resources.

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### CONFLICT OF INTEREST STATEMENT

There are no conflicts of interest related to this study.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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