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Research Article

Evaluating the Role of Social Media as a Supplementary Resource for Scientific Literature in the Management of Root Resorption

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Abstract

Background: This study compared the quality and accuracy of information about root resorption available on Instagram (IG) to scientific databases (DB). A secondary purpose was to determine if IG could be a valid aid to scientific literature to help providing data for uncommon clinical situations.

Methods: After PROSPERO protocol registration, a systematic search in DB and IG was conducted with the keywords external root resorption OR internal root resorption case reports. The content of posts from each platform was analyzed for accuracy, completeness, and adherence to evidence based guidelines. Two independent raters assessed the quality of the information.

Results: The analysis revealed a statistically significant lack of a one year follow-up data in Instagram cases compared to scientific database cases ($p<0.001$).Despite the different sources (IG and DB), the selected cases showed remarkable similarity in terms of general information and treatment protocols, except for arch and obturation variables. These findings support the appropriateness of the selection criteria

Conclusions: This study highlights the need for dental professionals to critically evaluate the information they encounter on social media platforms. Information obtained from IG could provide valuable insights for understudied conditions such as root resorption, but social media cannot be considered a valid source to supplement scientific literature under the current regulations.

Introduction

Social media (SM) has revolutionized the scientific community and medical education, enabling rapid information dissemination on the world's most visited websites [1]. Their use has increased among healthcare professionals at all levels [2]. Among the various SM platforms, Instagram (IG) has emerged as a popular tool for dental information dissemination and clinical case sharing. Its visual nature, with the ability to publish digital photographs accompanied by explanatory text, makes it particularly appealing for dental professionals [3]. This has led to the coining of the term "IG Dentistry" to represent the growing use of IG for dental communication [4]. However, concerns have been raised regarding its potential to promote unethical or unsafe dental practices [5,3]. One primary risk is the promotion of unrealistic expectations among patients for ambitious dental treatments [3]. Another risk lies in the potential spread of misinformation or misleading information about dental procedures [6]. To mitigate these risks and promote ethical use, dental professionals should verify the accuracy of shared information, avoid promoting unrealistic treatments, be transparent about outcomes, and respect patient privacy. McLean et al. [7] recently evaluated YouTube as a source of patient information about the risks of root canal treatment. However, there is no similar research on Instagram and no prior studies comparing Instagram to scientific databases.

On the contrary, evidence-based dentistry requires dental professionals to be intelligent readers of scientific literature with critical thinking and analytical skills. These abilities and a sufficient understanding of research methods enable an accurate diagnosis and treatment decisions to apply in clinical practice if scientifically valid information is available and has been correctly identified [8]. Moreover, to assist dental professionals in synthesizing available scientific information, experts often produce narrative syntheses or comprehensive reviews. These versatile research methods are used to integrate evidence from diverse sources and mainly involve three key steps: (1) developing a preliminary synthesis by reviewing and categorizing literature, (2) exploring relationships between identified themes, and (3) synthesizing findings to draw conclusions and make recommendations for future research [9,10].

At the same time, certain clinical conditions are relatively rare. Among these conditions, root resorption (RR) is the loss of hard dental tissue due to clastic cells action [11], a little-known phenomenon that arouses great interest in dentistry, as it is often misdiagnosed, leading to the formulation of an inadequate treatment plan [12]. The detection of the etiologies associated with this clastic pathology, along with establishing a consensus for early diagnosis and treatment planning using predictable techniques and materials, is crucial to enhancing the prognosis.

Well-designed studies that provide guidelines for successful outcomes for rare conditions are difficult to find. To quickly disseminate their work, clinicians currently report the least common and most interesting cases in their daily clinical practice through social media [3]. Gathering information from diverse sources can enhance knowledge, identify patterns and differences, support clinicians in drawing meaningful and informed conclusions, and explore ways to integrate social media content into the existing body of knowledge, ultimately benefiting both clinicians and patients.

Therefore, the main purpose of this review was to assess the outcome and treatment protocols suggested for RR comparing case reports published in peer reviewed journals to those posted in IG. A secondary purpose was to determine if IG could be a valid aid to scientific literature to help providing data for uncommon clinical situations.

Materials and Methods

This study adheres to PRISMA guidelines and has been registered in the International Prospective Register of Systematic Reviews PROSPERO (CRD42024530603). Two parallel electronic searches were conducted by two independent trained reviewers (C.G-L, S.G-G) to address the following PICO question: in cases of root resorption (P), could IG (I) compared to scientific literature (c)be considered a reliable source (O)? Reviewers were calibrated by performing a 'test' search with different keywords in order to check if comparable hits were retrieved.

A first search was then conducted in IG and a second search was conducted in electronic databases (Pubmed and Web of Science). The search strategy was based on simple keywords: 'external resorption case reports ' OR 'internal resorption case reports'. Keywords were converted in the hashtags #externalresorption OR #internalresorption when searching on IG.

Eligibility criteria

The initial search in both information sources included clinical cases, case reports and case series providing detailed information on the treatment of the root resorption. Inclusion and exclusion criteria were the same in both platforms. Publications in both English and Spanish were included in the search, publication date from January 2019 to December 2023. Further selection included those case reports that incorporated preoperative and postoperative radiographs and a minimum of one-year follow-up.

Cases were excluded if they were not published in English or Spanish, lacked detailed information on the treatment of the root resorption, or did not include both pre and post-operative radiographs. Additionally, for both platforms, cases with a follow-up period shorter than one year, those focusing on primary dentition, and those solely based on in vitro or in vivo experiments were excluded. Products advertisement posts and cases discussing resorption unrelated to dentistry were also omitted. Finally, forum discussions and other informal publications were not considered for this review.

Case selection

After running the search strategy, a reference management program (EndNote, version X9, Clarivate Analytics), was used to store the files. Duplicates identified were removed in a two-way approach: first automatically by the software program and then manually. Selection of relevant cases was performed in a three-step process: identification, screening and eligibility. In case of disagreement, a third reviewer was consulted (A.A).

A standardized checklist was developed to assess the quality of the included studies. The checklist specifically evaluated general information, diagnosis, and treatment information. Two independent reviewers assessed each publication using the checklist. Training was provided to ensure consistency in the application of the checklist. This training involved a dedicated session to review the checklist in detail, discuss its rationale, and provide specific examples of its application. To ensure reliability, a pilot assessment was conducted to identify and address any discrepancies in the application of the checklist. Cohen's kappa inter-rater reliability test was used to quantify inter-rater agreement.

Data extraction (selection and coding)

Data extraction was performed by 2 independent reviewers (C.G-L, S.G-G). Data was collected in an Excel spread sheet and classified into three categories: a) general information about the publication, patient and type of resorption, b) diagnosis test included, c) treatment protocol. The following details were included in each category. The first category included name and country of authors, age, sex, tooth affected by the RR, arch position, type of resorption, and etiology. The second included pulp sensitivity tests used and imaging such as periapical radiography, cone beam computed tomography (CBCT) and photographs or video (for SM).

The third section documented the strict treatment protocol, specifying the type of treatment, debridement agents, and the need for endodontic therapy. Treatment information included materials, techniques, surgical approach (if applicable), hydraulic cement used, irrigation protocols (including solution and activation methods), obturation technique, intracanal medications, and the number of visits. Data was coded for further statistical analysis.

Quality assessment

A critical appraisal of the cases and IG posts was performed. Two independent reviewers assessed the eligibility of each study and post, using a pre-defined checklist following PRICE 2020 guidelines which includes patient demographic details, patient symptoms, medical history/previous dental history, clinical findings, diagnostic tests performed and their results, definitive diagnosis, treatment interventions performed (if any), follow-up periods, follow-up assessment methods and treatment outcome as described by Nagendrababu et al, 2020 [13].

Two independent raters assessed the need for inclusion of the publications. Inter-rater reliability was assessed using Cohen's kappa, resulting in a value of 0.85, indicating excellent agreement.

Publications in which conflicts of interest were reported and those that may have been subject to publication bias like products advertisements or marketing posts were excluded. Similarly, medical publications discussing non-tooth-related resorptions were excluded. The methodological quality assessment of the included cases was conducted using the modified Newcastle-Ottawa Scale.

Statistical Analysis

Selected cases and posts that met the inclusion criteria were further explored and a descriptive statistical analysis performed to determine the prevalence of the different types of RRs, as well as the commonly used protocols for the diagnosis and treatment of RR and compare them with the outcome in terms of tooth survival, radiographic evidence of reduction of apical or periradicular lesion size (loose criteria) and radiographic evidence of normal periodontal ligament space (strict criteria).

Further inferential statistical analysis was performed to compare differences between IG and DB in terms of types of RR included, diagnostic and treatment options employed using the Chi-square and Fisher exact tests and applying the Bonferroni correction and multiple proportion comparisons. The significance level was set at $p < 0.05$. IBM SPSS Statistics software v.29 was used for the analysis.

Results

Case selection

A total of 783 posts were retrieved from the search in IG, 274 were yielded using the hashtags #externalresorption and 509 for #internalrearesorption. An additional 26 relevant cases were identified through manual searching (13 for external resorption (ER) and 13 for internal resorption (IR)). All of them were assessed for eligibility. A total of 510 (63.75%) posts were excluded for at least one of the following reasons: 69% did not include relevant information regarding the treatment performed and management of RR, 12.2% were duplicate publications, 8.2%, were discussion based posts not including clinical cases, 6.1% were non related with RR, and 4.8% were products advertisement posts.

The initial search in Pubmed and WoS retrieved 460 results. A total of 385 articles (83.7%) were excluded for the following reasons: 43% were duplicates, 21% were medical resorptions affecting other vital organs, excluding dental tissues, 5.2% resulted in tooth extraction and RR was not treated (18 cases with ER and 6 cases with IR), 5% were non-related to RR, 4% of the articles could not be fully accessed, 4.2% did not include relevant information regarding the treatment performed, 0.5% were cases of primary dentition and in 0.5% tooth extraction was performed after temporary treatment in an attempt to gain time for implant placement or autotransplantation. Thus, in total 299 cases from IG and 75 from the scientific database search were selected after the first round. However, out of these, only 29 cases from IG and 69 from electronic database of the initial posts and publications included preoperative and postoperative radiographs, a minimum of one-year follow-up and complete information of the treatment performed. Hence, 9.7% and 92% of the cases selected after the initial screening were included for further analysis respectively from IG and scientific database search. Figure 1 shows a flow diagram for case selection from both sources (IG and scientific databases).

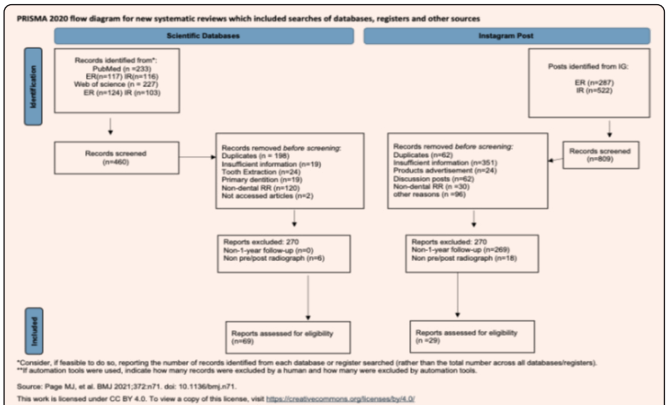

Figure 1: Prisma flow-diagram for case selection from both sources, IG and scientific databases.

Synthesis of the results

In a first set of analysis, a statistically significant difference was detected between the cases retrieved from scientific databases and those retrieved from the social platform IG in terms of including a minimum of one-year follow-up ($p<0.001$). From the 98 cases that met the inclusion criteria, 32.6% (29) were from IG and 67.4% (69) were from scientific databases. Moreover, despite the lower number of retrieved cases in scientific databases compared to IG, they also reported a significantly higher detailed information about patient characteristics (gender, age), etiology of RR, pulp status and photographs ($p<0.001$). At the same time, as described in Table 1, there were no statistically significant differences between the cases selected from both sources for the use of CBCT or the inclusion of a 5-year follow-up. Table 1 shows the percentage of cases from both sources that included the most relevant information.

Table 1: Percentage and p values from Fisher exact test of case reports that included relevant information from both sources. *Videos were not included in cases retrieved from scientific databases (Non-Applicable (NA)).

Relevant information	Scientific databases	IG	p
Gender	95.70%	6.90%	<0.001
Age	98.60%	13.80%	<0.001
Etiology RR	59.40%	17.20%	<0.001
Pulp status	85.50%	41.40%	<0.001
Photographs	79.70%	41.40%	<0.001
Videos	NA*	10.30%	-
5-year follow-up	20.30%	10.30%	>0.05
Complemented with CBCT	52.20%	58.80%	>0.05

Tables 2 and 3 summarize the findings related to general information as well as types of RR reported, diagnostic and treatment options employed both in SM and scientific databases. P values are also displayed when a statistically significant difference was detected.

The majority of cases originated from North America. Patients aged 7-16 years were most frequently represented in the samples. The upper maxilla, especially anterior teeth, was the primary site of resorption ($p=0.026$) and orthodontics and traumatism were identified as the primary etiological factors. Cervical external resorption was the predominant type in DB cases, whereas non-perforating internal resorption was more common in IG cases. Necrosis was the most prevalent pulp status. Orthograde treatment was the treatment of choice. In fact, no significant differences were found between the 2 cources, except for irrigant solutions. NaOCl was used more frequently in scientific databases ($p<0.001$). Vertical compaction was the most common obturation technique, but the hydraulic single-cone obturation technique was significantly most used in IG ($p<0.001$), in contrast to lateral compaction, which was more common in scientific studies ($p<0.001$). IG cases were more frequently completed on a single-visit.

Table 2: Summary of information related to the publication, patient, tooth status and type of RR. Percentages for the different categories and p values (when significant differences were detected) for cases from both information sources (Scientific databases and IG) are included.

General information		Scientific databases	IG	p*
Origen of the publication	North America	52.4%	31%	
	Europe	27.5%	41.4%	
	Asia	13%	20.7%	
	Others	7.2%	6.9%	
Gender*	Female	51.5%	50%	
	Male	48.5%	50%	
Age (years)*	16-Jul	30.9%	75%	
	17 - 26	29.4%	-	
	27 - 36	17.0%	-	
	37 - 46	7.4%	-	
	47 - 56	4.4%	-	
	57 - 66	4.0%	-	
	67 - 73	6.9%	25%	
Arch	Maxillary	78.8%	55.2%	0.026
	Mandibular	21.2%	44.8%	
Etiology	Traumatism	63.4%	60%	
	Orthodontics	14.6%	20%	
	Others	22%	20%	
Tooth affected	Maxillary anterior	68.2%	58.6.%	
	Mandibular anterior	10.6%	17.2%	
	Maxillary premolar	6.1%	-	
	Mandibular premolar	4.5%	-	
	Maxillary molar	9.1%	17.2%	
	Mandibular molar	1.5%	6.9%	
	Non-perforating IR	20.3%	27.6%	
	Perforating IR	15.9%	17.2%	
	Inflammatory ER	23.2%	34.5%	
	Replacement ER	8.7%	-	
	Cervical ER	31.9%	13.8%	
	Surface ER	-	3.4%	
Pulp status	Necrosis	78%	75%	
	Vital	22%	25%	

Table 3: Summary of information related to the treatment protocol. Percentages for the different categories and p values (when significant differences were detected) for cases from both information sources (Scientific databases and IG) are included. Superscripts (a,b) indicate statistical differences between IG and BD.

Treatment protocol	Scientific databases	IG	p
Type of treatment			
Orthograde treatment	71%	86.2%	
Reimplantation	8.7%	-	
Regenerative techniques	8.7%	-	
Restoration	5.8%	3.4%	
Others	5.8%	10.4%	
Use of surgical approach	15.9%	13.8%	
Use of trichloroacetic acid	5.8%	10.3%	
Use of intracanal medication	50.7%	31%	
Irrigant solutions			
NaOCl + EDTA	55.3%	60%	
NaOCl alone	36.8%	20%	<0.001
Others	7.9%	20%	
Irrigant activation			
Ultrasonic	94.2%	86.20%	
Xp-Finisher	4.3%	3.40%	
Sonic	1.4%	6.90%	
Obturation Technique			
Vertical compaction	45.7%	23.5%b	
Hydraulic (single cone)	2.9%[a]	11.8%	
Hydraulic	17.1%	-[b]	<0.001
Lateral compaction	28.6%[a]		
Others	5.7%		
Number of visits			
Single visit	34.7%	65.3%	
Two or more visits	55%	45%	

*p-values are reported only when statistically significant differences were found.

Quality assessment of IG posts revealed a moderate risk of bias. In contrast, DB studies demonstrated much lower risk of selection bias.

Discussion

This study aimed to compare the content available in two very different sources of information, IG and scientific databases, the main difference being the lack of official filters for their publication or dissemination. As IG is a dissemination platform with a high impact, there is a possibility that certain techniques or information not endorsed by the scientific community may be widely disseminated. Although the information is published by professionals presenting their clinical cases in both sources, the target audience vary. SM targets the general population seeking information on specific topics, whereas scientific databases are less accessible to the public. In fact, McLean and Mair [14] have emphasized the need for greater scrutiny and critical review on SM platforms, such as YouTube, to mitigate the dissemination of low-quality medical information.

In the present work, publications from both sources were identified using criteria similar to those applied in systematic reviews, to quantify the publication volume, highlight the primary differences between both communication platforms, identify their advantages and recognize any potential shortcomings. In fact, the main purpose of the present report was to assess the outcome for RR comparing case reports published in peer reviewed journals to those posted in IG. In general, failures were not published in SM sources despite the large volume of communications that exceeds official sources. A secondary purpose was to evaluate whether IG could serve as a complementary tool to scientific literature by providing data on uncommon clinical situations. However, once quality filters were applied, the number of eligible clinical cases was substantially reduced. When this information is directed toward a potentially uninformed public, it risks leading to misinformation or reinforcing certain techniques or materials, using the visual and marketing tools characteristics of these social networks which help amplifying the message [16,17].

Discrepancies between information provided on SM and that presented in scientific literature were relevant in the present study highlighting the importance for both healthcare professionals and the general public to critically evaluate information obtained in SM platforms and seek evidence-based content. The PRICE 2020 guidelines and checklist offer a valuable framework for selecting endodontic case reports. By applying these guidelines to both traditional and SM publications, the overall quality and rigor of case reporting in endodontics can be enhanced [13]. Following the guidelines, an initial screening reduced the number of publications to 299 and 75 publications respectively for IG platform and scientific DB. Very importantly, a clinical and radiographic follow-up after treatment of at least one year and up to four years has been suggested in endodontic literature [18]. Therefore, when limiting the selection to publications including pre and postoperative radiographs and a minimum of one-year follow-up, the number of publications in the IG group was further reduced to 29 and decreased to 69 for DB group, representing respectively a 9.7% and 92% of the cases selected after the initial screening. This alarming difference again highlights the lack of rigor in SM platforms. Out of these, only 10.3% of IG posts provided 5-year longitudinal follow-up data, compared to 20.3% of database publications.

Other relevant information, such as etiology and patient and tooth-related data, was also significantly more prevalent in scientific sources compared to IG publications. This suggests a more comprehensive collection of diagnostic data in scientific literature. Regarding the resorption type, in accordance with previous findings [19,20,21], both sources indicated that ER was more prevalent than IR. However, cervical ER was the most frequent type in IG group, while inflammatory ER predominated in DB group. At the same time, other similarities were also detected in both groups. For instance, there is a higher prevalence of RR in female patients, although this information is frequently not reported in IG. Additionally maxillary central incisors are more prone to RR, followed by maxillary lateral incisors, and more frequently observed in the 7-16 year age group. These results are consistent with current scientific evidence [22,23]. The higher prevalence of resorption in teeth 11 and 21 may be related to their prominent position in the dental arch and their greater susceptibility to trauma.

Early diagnosis, aided by periapical radiographs [24] and CBCT [25], is essential for optimizing treatment outcomes, especially in cases of inflammatory ER associated with granulomas [26]. In contrast, although pulp sensitivity tests are crucial for an accurate diagnosis, roughly a 30% of the posts published in IG present this information whereas it is documented in 93% of reported cases in DB group. Pulp necrosis was a common finding in cases of RR as described by Alghaithy and Qualtrough [27]; however, this information is crucial and should always be included when reporting a case with RR to determine if the tooth could be restored without the need for root canal treatment.

RR has a multifactorial etiology. According to dental literature, dental trauma was identified as the major etiological factor in both DB and IG groups, followed by orthodontic treatment [28,29]. Numerous studies have identified genetic predispositions linked to an increased risk of root resorption (RR) following endodontic treatment [30]. However, due to challenges in pin-pointing the exact cause of RR, these genetic associations are not consistently reported. Beyond trauma and orthodontic treatments, a wide array of etiological factors have been implicated, including caries, periodontal disease, cracks, and idiopathic pulpal changes. Certain dental procedures, such as excessive heat during restorations or root resections in vital pulps, as well as the use of calcium hydroxide [29,30], have also been associated with RR. Moreover, viral infections (varicella zoster [31,32], hepatitis B [33]), thyroid

disorders (hyperparathyroidism) [34], and systemic factors like bisphosphonate use [35,36] and hypoxia [37] have been reported as potential contributors to RR. Parafunctional habits, poor oral hygiene, and periodontal treatment [38] have been implicated in RR, particularly in superficial and replacement resorption. Superficial RR is commonly associated with impacted teeth, orthodontic treatment, cysts, and tumors, while inflammatory RR is often linked to necrotic pulps due to caries or failed endodontic treatment. Replacement RR is frequently related to intrusion and avulsion injuries [30].

Treatment options for RR vary based on the severity, etiology, and the presence or absence of a communication with the periodontium. If the communication cannot be repaired internally, a surgical approach is required [30], with 15.9% of DB and 13.8% of IG cases included in this manuscript opting for this option. Current research is also exploring regenerative techniques as an alternative treatment option [39] although this approach was observed only in DB group. In the presence of a communication with the periodontium, various restorative materials have been recommended including composite, glass ionomer cement, and calcium silicate cements such as MTA and Biodentine [3]. MTA was the material of choice for the repair of RR in the present study (52.7% for DB and 48% for IG group). While trichloroacetic acid has been suggested for debridement of the resorptive area [40,41] sodium hypochlorite is also commonly used [39]. Only 5.4% of DB case reports and 10.3 % of IG employed trichloroacetic acid in the present study.

When a root canal treatment was performed, sodium hypochlorite and EDTA were the most used irrigant solutions (55.3% of cases); intracanal medication was employed in 50.7% of DB and 31% of IG, as previously recommended [43]. Vertical compaction was the most frequently used obturation technique, also previously suggested in scientific literature [40], followed by lateral compaction techniques. No cases of replacement ER were reported in IG, probably due to the uncertain prognosis of this type of RR that led to ankylosis, infraocclusion, and subsequent decoronation [31].

Several measures could be implemented to improve the quality of information about endodontic resorptions published on IG. These measures could include promoting the creation of content by accredited healthcare professionals. This could involve encouraging endodontists and other relevant healthcare professionals to share their knowledge and expertise on IG by creating high-quality, evidence-based posts. Another measure could be developing strategies for educating the public on the critical use of SM. This could involve raising awareness about the potential for misinformation on SM and providing tips on how to identify and evaluate the quality of information online. In fact, the quality assessment of IG posts revealed a moderate risk of bias, likely due to the influence of Instagram's algorithms. In contrast, DB studies demonstrated a much lower risk of selection bias. These findings highlight the limitations of using SM data for research.

The main limitations of the present study, aside for the retrospective design, include the restrictions on database selection and language. The search was confined to PubMed and Web of Science, potentially excluding relevant research published in other databases. Additionally, IG posts were included if published in English and Spanish, which may introduce bias due to the self-selection nature of SM content. Lastly, the exploratory nature of this methodology review may have introduced some bias due to the lack of homogeneity among the included studies. Therefore, the findings of this review should be interpreted with caution.

At the same time, this study offers an original approach by comparing and analyzing the existing evidence from a heterogeneous body of literature, which includes a wide range of sources from scientifically peer-reviewed publications to SM content. This approach has not been used before in the field of endodontics but seems relevant due to the current significant impact of SM in young professionals. Traditional sources use peer review processes, include patient/ethical authorization prior publication, the authors must provide affiliations, and misleading information may result in retractions or even the removal of an article. To determine if IG could be a valid aid to scientific literature for uncommon clinical situations, a first analysis included all available posts to detect the initial prevalence of IG posts. A second screening allowed the comparison for the inclusion of relevant criteria with both sources (IG and DB). The two-step approach ensured that the analysis is not biased by pre-existing assumptions or limitations of specific search algorithms. In essence, the approach tried to explore the potential of using a real-world dataset to identify and analyze content that aligns with scientific principles, even if it originates from a non-traditional source.

Further research is needed to corroborate these findings and develop effective strategies for enhancing the quality of information available on SM. Despite its limitations, this study provides valuable insights into the scarcity of filtered information on IG and emphasizes the need for strategies to improve it. Establishing quality criteria for selecting relevant publications on both platforms is essential. The results of this study further suggest the need of regulatory guidelines on the use of SM platforms for dental professionals. The implementation of measures for quality control based on peer review processes or some type of validation by scientific committees could enhance the rigor and credibility of IG posts. Moreover, when publications on SM are filtered based on scientific criteria, they could offer valuable support for uncommon clinical scenarios.

Conclusion

Social media cannot be considered a valid source to supplement scientific literature under current regulations. Instagram posts lack relevant information and case follow-up, rendering the results anecdotal. Consequently, favorable outcomes are neither demonstrated nor guaranteed by the suggested treatment protocols. The implementation of some regulations would be beneficial, as it could enhance the reliability and scientific rigor of the information shared on social media platforms.

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