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Illustrating the Role of Dental Journals in the Translational Science Process

RESEARCH BRIEF

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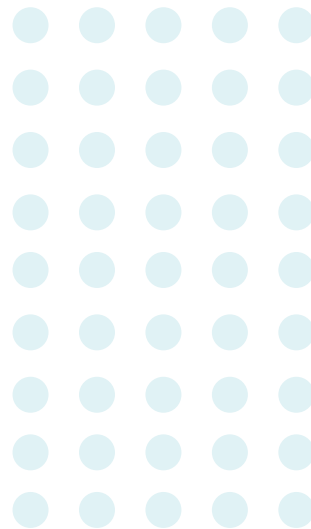Communication Specialist
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Illustrating the Role of Dental Journals in the Translational Science Process

Background

Seminal research developed in 2000 and again in 2011 established a 17-year research- practice gap between the timeframe in which a research question is asked and a clinical practice stemming from that research question is finally adopted.[1-4] As described by Green, the "17-year odyssey" outlines the research-to-practice pipeline that begins with setting priorities for funding research, publishing and peer review, research synthesis, developing guidelines for evidence-based practice, then finally as applied practice as shown in Figure 1.[5,6] This process, which spans nearly two decades, delays the translation of research findings into healthcare settings, creating health inequities, poor outcomes, dissatisfaction, and wasted effort from expensive and time-consuming research.[2,7,8]

This gap translating research into practice is not only observed in healthcare, but in other research domains such as education, communication, and agriculture.[9] Few studies have focused on the implementation gap within oral health domain.[10] This report depicts barriers within the dental peer-reviewed publication process that slow the translation of research to clinical implementation. This illustration is relayed in three parts: an environmental scan of dental journals, a brief survey of dental journal editors, and a qualitative analysis of interviews with dental journal editors. Together, these data points show the important role dental journals play in oral health's research-practice gap.

Figure 1
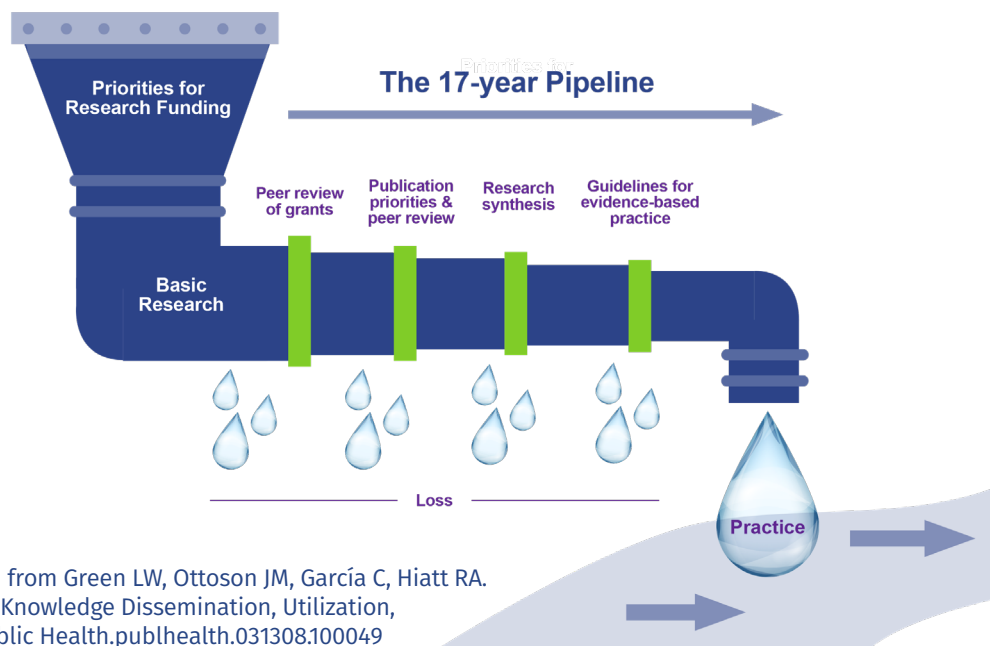
Used with permission from Green LW, Ottoson JM, García C, Hiatt RA. Diffusion Theory and Knowledge Dissemination, Utilization, and Integration in Public Health.publhealth.031308.100049

Part One: Environmental Analysis

Methodology

In the fall of 2021, an environmental scan of dental journals was conducted to evaluate impact, publishing metrics, editorial design, publication costs, content volume, and audience reach. The SCImago Journal and Country Rank portal was used to select the top 50 ranked international dental journals.[11] Journals that did not have a specific dental focus or were no longer actively published were excluded, resulting in a final sample of 46 journals. A full list of included journals is listed in **Table 1, Appendix A**. Metrics published by SCImago including journal H index, number of recent articles published, number of references included in published articles, the citations received by the journal's articles, and the number of citable articles were evaluated.

Accompanying data were collected from a journal's website and joined with publication data included coverage years, associated organization, funding organization, journal focus, editorial team characteristics, and review time. When available, the publication time was also evaluated alongside financial data such as journal subscription cost, article

The average subscription fee charged by the journals was $291.78 with an average review time of 49 days.

submission fee, open access fee, special issue fee and article access fee from each journal website. For websites with incomplete information, journal editors were emailed directly with data requests. Using this process, information on open access fees was made available from roughly half the journals queried and information on editorial board characteristics was available from 29% of journals.

Results

The majority of journals (74%) reviewed were based in the United States, with an average H index of 67.48, ranging from one to 182. In the last three years, selected journals published an average of 370 papers with an average of 797 references per paper. The average cost of open access fees to authors was $2,113.95 (valid n = 21) and the average subscription fee charged by the journals was $291.78 (valid n = 40). Seventeen percent of journal editors (n=7) reported having no fee for journal subscription. The average review time was 49 days (valid n = 33) with 36% of journals (n=12) reporting a review time of longer than two months. The average acceptance rate was 25.3% (valid n=16). See **Table 2 in Appendix A** for a full list of journal review times, journal subscription fees, and article access fees.

The journal's H index was positively correlated with the number of members on the editorial team (r = 0.39, p < .05) as well as the number of publications from the last 3 years (r = 0.675, p < .01). No correlation was observed between the number of editors on the editorial board and the review time (r = 0.04, p > .05). There was no correlation between gender diversity

and H index (r = 0.12, p > .05). We analyzed the journals' primary focus for publication (valid n = 43) and found that "all areas of dentistry" was the most common focus (20.9%) followed by "implant dentistry" (11.6%). No journal mentioned health equity or health access as its focus. Furthermore, "public health dentistry" was one of the least mentioned (2.3%), with just one journal.

Takeaways

- In alignment with our expectations, the H index was related to how many publications a journal released; however, the index was also strongly linked to the number of editorial team members.

- Editorial team characteristics were not associated with any other impact metrics.

- Public health was the lowest cited focus of journals and was therefore not connected with impact characteristics.
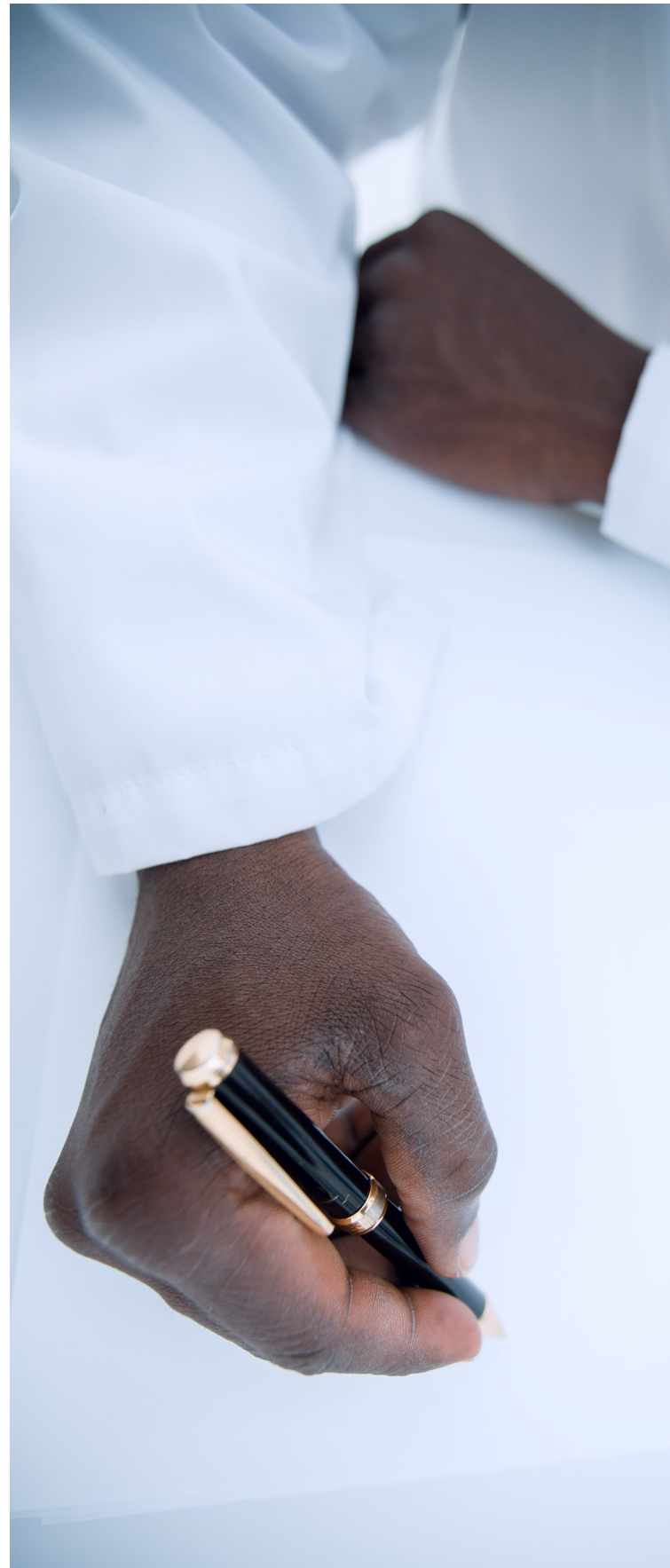
Part Two:
Journal Editor Survey

Methodology

For the second part of the study, a two-part survey was disseminated to all journal editors from the same sample of 46 dental journals. Editors were asked to complete the survey and then schedule a subsequent interview (discussed in part three). The survey and interview guide were approved by the Western IRB. The survey assessed the journal's:

- Intended Target Audience
- Open Access Quality
- Null Hypothesis Publications
- Influences of Publications
- Topic Prioritization

There was a 20% response rate from all editors who were contacted (n = 10).

Results

The number of years journal editors served in their role varied, with 30% having been an editor for between 0-3 years, and 30% having been an editor for more than a decade. When asked about their journal's target audience, editors selected Dentists, Dental Specialists, Clinical Researchers, and Public Health Professionals. No editors selected Dental Industry, Primary Care Providers, Health Policy Professionals, and The Public. When asked about the quality of open-access journals, all respondents (100%) perceived that open-access publications in their own journal had the same quality as closed-access publications. However, respondents perceived that 30% of other open-access journals were of poorer quality than closed-access journals.

Dental journal editors were asked how often null hypothesis data is published in their journals. They indicated null hypothesis data were published roughly 57% of the time, with a range of 22% to 86%. When editors were asked which factors impact prioritization of topics for publication, top responses included novel topics, emergent needs, and health policy changes. The least common responses included replicated topics and CODA Standards/Healthy People 2020/2030 Standards. Lastly, 40% of journal editors reported only communicating articles via traditional publication channels. The remaining 60% used at least one social media channel, with Twitter being the most common.

Takeaways

- Dental journal editors did not select health policy professionals as a target audience, despite prioritizing health policy changes among publication topics.

- Null hypothesis and replicated studies were disregarded as high priority topics for publication— two research approaches that can strengthen best practice development.

- Few dissemination tactics were used to communicate journal findings outside of a traditional electronic publication method.

Over half of editors use social media to communicate about articles.

Part Three:
Journal Editor Interviews

Methodology

Four journal editors were interviewed about their journal's editorial process and translational science in oral health more broadly. Semi-structured interviews lasted 30 minutes with guiding questions and follow-up probes as needed. All interviews were conducted via Zoom at a self-selected time. Interview recordings were then transcribed then analyzed using NVivo.[13] Data were analyzed by identifying and coding common themes. The frequency of code occurrence was used to guide and frame the qualitative analysis.

Results

Qualitative exploration revealed four main themes, listed in Appendix B with underlying codes and exemplar quotes. A summary of each theme is below.

Theme 1: Factors Impacting Translation of Research into Clinical Practice

Editors reported that financial barriers inhibit the translation of research to clinical practice. Expenses such as journal subscriptions and publication fees may limit the number of consumers who read peer-reviewed articles and researchers who publish. Editors also suggested that translation is slower when practitioners are "set in their ways." Another reported challenge was ensuring the accuracy of information when peer-reviewed materials are translated into broader formats. Topics like minimally-invasive dentistry and standardization of data/development of regulatory standards were suggested as slower to translate into clinical practice.

"I think that's a real challenge to make sure that the messages that are being published in peer-reviewed papers are accurately depicted when they get translated into a much broader format that people can digest" ~ Interview 2

Editors suggested offering continuing education credits to encourage learning about "hot topics like COVID-19" and policy mandates to keep up with new evidence-based practices that may serve as facilitators to clinical practice adoption.

Theme 2: Editorial Challenges to Peer Review

Some journal editors reported that small pools of reviewers increase turnaround time for peer review. When asked about reviewer selection criteria, editors described recruiting reviewers who have previously published in their journal on that topic, with a preference for those who return reviews in a timely manner. Regarding the types of articles that are published and their communication methods, editors intend to publish a range of articles while also prioritizing current "hot" or relevant topics. One participant shared that editors try to publish a range of articles, but face strong competition from other journals as well as other types of non-peer reviewed publications. All interviewees relayed that open-access journals have caused concern, particularly "predatory" journals, which return reviews quickly in exchange for higher fees. While open-access publications were not viewed favorably by most

interviewees, most acknowledged other information coming from a reputable source (e.g. a credible dental organization) may expedite adoption. Editors also recommended transparency to avoid potential conflicts of interest.

"I am very critical of the process [of non-peer-reviewed publishing]. It is a flawed process and not a good way [to disseminate research]. It is not a good one because it plays on the bias of people..." ~ Interview 3

Theme 3: Economic Barriers to Equitable Access
Some editors acknowledged that authors who want to remove paywalls to access their research and don't have funding to support open-access fees experience economic barriers. On the other hand, editors acknowledged that open access fees cover the cost of journal functioning requirements, thereby sustaining journal administration costs. One respondent shared that costs are either taken from the author or the subscriber when making an article free to view through open access — a notable barrier to equitable access of peer-reviewed publications. Editors also acknowledged that consumers are often limited to publications whose subscriptions are supported by their academic institution.

"Unless something truly remarkable is going on in the literature, I don't think most oral health professionals are accessing the literature routinely because it's challenging; it costs money for subscriptions if they don't have access to academic libraries, etc."
~ Interview 4

Theme 4: Journals' Target Audience
Editors described their target audiences (listed by frequency from highest to lowest): health professionals who are highly engaged in the field and who are seeking information to facilitate clinical behavior change; people at academic institutions; health program administrators; clinical researchers;

and the general public. Most cited clinical researchers in their specialized areas as the primary audience. Most editors described a belief that publications don't have a significant impact unless they focus on a remarkable topic or fill a gap in the literature, an important subtheme revealed in analysis. Some interviewees stated that they designed their journal to fill a niche area where they observed not much was being published (e.g., studies specific to some geographic areas). One journal editor mentioned feeling a responsibility to communicate health information to the general public.

"I think [it is] on us to communicate with the general public so that they can try and encourage and promote their own oral health too." ~ Interview 4

Takeaways
- Economic barriers were a clear emerging theme when describing the translational process in oral health. Editors noted the conundrum of having to financially sustain a journal through open-access and subscription fees while also acknowledging these costs ultimately limit the dissemination/submissions within target audiences.

- Limited reviewer pools slow down the peer-review process. Other open-access journals may be more enticing to authors who have significant funding and want to publish quickly, although all editors relayed concerns with the quality of publications stemming from this "pay for play" model.

- Editors broadly acknowledged prioritizing novel or "hot" topics in the editorial process but also emphasized how important evidence-based strategies, like minimally invasive dentistry, were slower to adopt into clinical care.

Figure 2 on the following page depicts the different barriers and challenges faced throughout the journey from conducting research to dissemination of findings within the peer-review process.

Discussion

Funding Inhibits When and How Clinical Research is Implemented

Economic and resource barriers were identified as one factor hindering timely dissemination to the intended audience. The average cost of open access fees to authors was $2,114 (n = 21), which falls within the middle percentile of national average costs ranging from $0- $5,200.[14] Dental journal editors acknowledged that open access fees limit the number and type of authors who can publish in this format, but also justified the cost as necessary to cover journal administration and processing expenses.

Open access publications are associated with accelerated dissemination of clinical knowledge, higher citation rates, more views, and increased recognition by peers.[15–17] Considering the implications alongside the funnel of the "17-year Odyssey," journal editors reinforced the importance of research funding, which drives the ability not only to conduct research but to afford the peer review process in legitimizing and disseminating the results.

Publication Processes Favor Novel and Emerging Topics

Editors relayed a propensity to prioritize novel and emerging topics while acknowledging that null hypotheses and replication studies are published less frequently. Both types of data can either expand or strengthen the evidence base. In particular, replication studies may increase the frequency of clinicians who see the same findings to expedite adopting evidence-based practices.[18,19] Some journal editors indicated they were "less enthusiastic" about studies without significantly different results. Null hypothesis reporting, while not statistically significant, can be clinically significant. Narrowing the spectrum of reported results to favor emerging or novel topics may limit insights and granularity associated with the nuances of clinical care delivery.

Figure 2

RESEARCHER JOURNEY

Researcher looks for funding, conducts the study, and analyzes results. → Researcher decides to publish the study. → Researcher submits study for journal review. → Study is accepted for publication. → Research is published and disseminated.

POTENTIAL BARRIERS TO TRANSLATION

Economic and Resource Barriers
- Suitable funding
- Publication fees

Editors' Challenges
- Journal priorities
- Review process
- Publication bias
- Research topic

Target Audience
- Equitable access
- Open access
- Journal subscription
- Current research topic
- Practitioners acceptance

Do Peer Reviewed Publications Meet the Target Audience?

All three analyses evaluated how peer-reviewed publications were effectively and efficiently delivering evidence-based research to the target audience of clinical adopters. Considering quantitative metrics like H index, citation frequency and qualitative responses from editors, the results were mixed. Most editors agreed that target audiences (e.g. clinicians, the general public, or health policy professionals) were difficult to reach and mostly limited to those who could afford a journal subscription.

Interestingly, journal editors also acknowledged a discrepancy between desired target audience and actual target audience, suggesting an incongruent process for disseminating publications. This barrier could be addressed by investing time and energy into making findings more accessible through broader communication platforms like social media; however, only 60% of survey respondents indicated using any social media platforms. Broader communication tactics may also reduce silos and echo chambers caused by narrow audiences in developed peer-reviewed journal concentration.[20]

Closing the research-practice gap requires applied integration of the evidence base and dissemination to a broad audience.[20]

Limitations to This Analysis

While the combination of this mixed-methods analysis illustrates trends in the translational process of oral health research, the results are not generalizable and the implications are guarded. Limited participation from journal editors resulted in a small sample size. The qualitative data were rich and the combined analytical approach paints a picture of the facilitators and barriers of the research-practice gap, which can be considered in conjunction with the broader implementation science evidence base.

Strategic Recommendations

1. **Evaluate opportunities to reduce funding barriers.** The most prominent theme among all three analyses was the role of financing in each segment of the research-to-practice pipeline. Funding is required to conduct research (e.g., IRB fees, staff, materials, etc.), publish research (e.g., journal fees, open access fees), and access research (e.g., journal subscriptions). The resulting evidence base structure of clinical practice is ultimately controlled by who can access and maintain funding. True equity cannot be authentically integrated into the peer-review process and the overall research-practice pipeline without addressing the financial barriers. While this system is complex, funders could consider financially supporting the overall operations of peer-reviewed journals to remove dependencies on open-access fees and subscriptions. Journal editors may have the flexibility to allocate funding toward paying peer reviewers for their time and expanding dissemination tactics to ensure broader access. Publishing companies can also consider reducing their considerable profit margins to ensure greater public good and timely access to science.[21]

2. **Broaden access to peer-reviewed information.** After removing the financial barriers to access journal articles, editors may have more opportunities to broaden dissemination and ensure easier access among target audiences. Investing in multiple communications methods, like social media, graphical abstracts, infographic design, etc. may extend access to peer-reviewed research past academicians. Using varied communication channels to connect target audiences with open-access research likely expedites the research-practice time gap. Publishing companies can choose to reduce or remove fees for open-access research, ensuring availability of the evidence base using varied communication tactics.

3. **Increase funding for and publication of replication studies.** Editors shared a propensity to prioritize novel research compared to replication studies, a common trend in academic publishing.[22] Funding opportunities to conduct replication research are also limited. Some research suggests that, when studies are replicated, additional nuance can be gathered to reinforce results, strengthen connections, and discard extraneous findings.[23] It is possible with repeated exposure to the same or similar studies, practitioners may adopt evidence-based practices faster. Further research is needed to evaluate the discrepancy between actual publication bias and perceived bias by journal editors if such a discrepancy exists.

4. **Explore innovative technologies in clinical settings.** Technology is a significant facilitator of the research-practice gap. Leveraging innovative technology to expedite research into clinical practice can increase adoption of peer-reviewed approaches. Clinical decision-making tools and learning health systems are developing ways to innovate best practice implementation by streamlining communication and providing usable data insights at clinical encounters to provide a higher level of personalized care design.[24] Clinical decision tools and learning health systems may improve the quality of care, improve patient safety, and reduce waste.[25]

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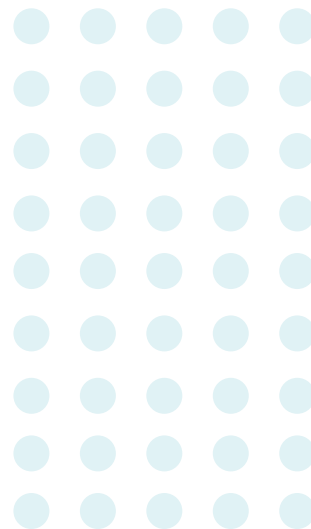
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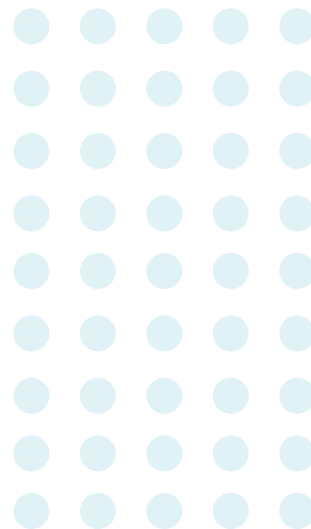
Appendices

Appendix A: Tables for Environmental Scan

Table 1: List of dental journals examined

1	Journal of Dental Research
2	Journal of Periodontology
3	Journal of Endodontics
4	International Journal of Oral and Maxillofacial Implants
5	Journal of Prosthetic Dentistry
6	American Journal of Orthodontics and Dentofacial Orthopedics
7	Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology
8	Journal of the American Dental Association
9	International Journal of Oral and Maxillofacial Surgery
10	International Journal of Prosthodontics
11	Angle Orthodontist
12	Clinical Implant Dentistry and Related Research
13	International Journal of Periodontics and Restorative Dentistry
14	Operative Dentistry
15	Cleft Palate-Craniofacial Journal
16	Journal of Cranio-Maxillo-Facial Surgery
17	Molecular Oral Microbiology
18	American Journal of Dentistry
19	British Journal of Oral and Maxillofacial Surgery
20	Australian Dental Journal
21	Pediatric Dentistry (discontinued)
22	Journal of Adhesive Dentistry
23	Journal of Dental Education
24	Implant Dentistry
25	International Dental Journal
26	Journal of Public Health Dentistry
27	Journal of Esthetic and Restorative Dentistry
28	Journal of Oral Implantology
29	International Journal of Oral Implantology (New Malden, London, England)
30	Journal of Contemporary Dental Practice
31	Journal of Clinical Pediatric Dentistry
32	Journal of Oral and Facial Pain and Headache
33	Journal of Clinical Dentistry

Appendix A: Tables for Environmental Scan
(continued)

Table 1: List of dental journals examined *(continued)*

34	Special Care in Dentistry
35	Journal of Dentistry for Children
36	Australian Endodontic Journal
37	General Dentistry
38	Oral health & preventive dentistry
39	International Journal of Dentistry
40	Journal of Evidence-Based Dental Practice
41	Dentistry Today

Table 2: Journal Review Time, Journal Subscription Fees, and Article Access Fees

Journal Review Time (N=33)		
Less than 1 month	13	39%
1-2 months	8	24%
More than 2 months	12	36%
Journal Subscription Price (N=40)	n	%
No fee	7	17%
< $200	4	10%
$200 to $399	14	35%
$400 to $599	14	35%
$600 or more	1	3%
Article Access Fees (N=35)	n	%
Less than $20	8	23%
$20 to $39	16	46%
$40 or more	11	31%

Theme	Supporting Codes	Exemplar Quotes
Factors Impacting Translation of Research into Clinical Practice	■ Barriers to translation from research ■ Facilitators for implementation ■ Examples of topics – slow implementation ■ Examples of topics – quick translation ■ Methods of information sharing ■ Recommendations for translation	*"Most clinicians are not reading seven or eight journals, they don't have these subscriptions are expensive"* – Interview 1 *" It's really really challenging to get [dental practitioners] to change behavior because they're uncomfortable. Now they don't feel they've been hurting patients they're going fine about it, you know. It's painful to learn new techniques and new skills if you don't feel the need"* – Interview 1 *"They're very detailed and because of that, they are really only read by quite a specialist audience. So it's quite difficult to communicate that more broadly with the sort of general public and I think that's a real challenge to make sure that the messages that are being published in peer reviewed papers are accurately depicted when they get translated into a much broader format that people can digest"* – Interview 2 *"CPE credits offered or things that will get people to engage with a new and important study."* – Interview 1 *"Covid 19 has been something that's come up quickly that that was sort of a catalyst that has expedited the implementation of research."* *"The thing that the message that we get clear from implementation sciences it's highly contextual, whatever works in this clinic may not work in this clinic."* – Interview 4
Editors' Challenges	■ Problems faced by journals ■ Equity in publishing ■ Factors considered for open access ■ Conflicts in publication ■ Comparison with other types of publications ■ Comment about other journals ■ Review process ■ Factors considered for open access ■ Peer review process after submission ■ Reviewers reflect readership ■ Selection of reviewers ■ Factors considered for open access ■ Peer review process after submission ■ Reviewers reflect readership ■ Selection of reviewers	*"We do not bypass the peer review. So sometimes it just takes longer, but we are not super visible."* – Interview 2 *"Because of predatory journals, those databases and people managing those became more rigorous when evaluating proposals and turned [our journal] down because they want to see better quality."* – Interview 2 *"Even though we keep like a peer review and we publish things that are actually created, they [predatory journals] have some of the papers like observations of single family as a single cases and things like that, which are more traditional old fashioned papers that you see in the medical literature."* – Interview 2 *"They [other journals] have a two week turnaround between submission and publication or something like that. And you know, it's impossible to get proper peer review in that sort of time so they claim peer review, but it's, you know, in my mind this is not a peer review."* – Interview 3 *"I am very critical of the process [of non-peer reviewed publishing]. It is a flawed process and not a good way. It is not a good one because it plays on, on the bias of people and the ability of people to become nasty humans and they are anonymous and etc. so there is a number of flaws on that process that we also see."* – interview 3 *"I think the concern, a dentist can concern is that whether the information they're getting is independent of manufacturers."* – Interview 1

Appendix B: Main themes, underlying codes, and examplar quotes *(continued)*

Theme	Supporting Codes	Exemplar Quotes
Editors' Challenges *(continued)*	■ Problems faced by journals ■ Equity in publishing ■ Factors considered for open access ■ Conflicts in publication ■ Comparison with other types of publications ■ Comment about other journals ■ Review process ■ Factors considered for open access ■ Peer review process after submission ■ Reviewers reflect readership ■ Selection of reviewers ■ Factors considered for open access ■ Peer review process after submission ■ Reviewers reflect readership ■ Selection of reviewers	*"Obviously there's so much misinformation being spread these days on social media, it becomes really difficult to, to create some, some blog or some social media line that that is validated and really sort of provides useful information, you can do it within as if it's got the stamp of an official organization and, and it's a feed from an official organization and then that's one way that you can make sure that the people sort of rely on it."* – Interview 3 *"I select reviewers based on an accumulated knowledge that what works and what doesn't work, aided by the fact that I get several technology supports, I have a database within the software the scholar one software that anytime someone does a review, I can score them on the quality of that review. And so when I go back and look for viewers I have keywords on everybody I can pull up somebody by keyword and I can say, oh, they've done really good reviews in the past or maybe not, or they don't return their reviews in a timely manner I get all of that feedback."* – Interview 2 *"Well, I certainly don't typically include elected officials as my reviewers, but other than that everybody else I mentioned, is fair game. So I do feel that it does reflect them at some level, yeah."* –Interview 1 *"I certainly look for balance, but race, ethnicity, gender, age, not so much. But I do intentionally try to bring young people in who haven't done money reviews to sort of, you know, bring them along and encourage mentors you know people running residences and whatnot to maybe include a resident and a review process so they get their legs under them and can see it and then you know maybe the next time they'll be okay to do it on their own and that kind of stuff."* – Interview 1
Economic Barrier	■ Cost to publish ■ Inequitable access ■ Availability of funding ■ Subscription fees	*"It costs money to publish journals. Now there is a process that we don't expect journal publishers to work for free so there has to be resources so they're either going to come from the author so they're going to come from the subscribers. Those are pretty much where the resources come from. So, those costs, in and of themselves can provide a barrier to equity, right. If you can't afford to send your article in because they're going to charge you $3,000 for it then you're in a bad situation."* – Interview 2 *"If you start to write publication costs into every NIH grant, it's going to cut down the number of grants that are funded."* – Interview 2 *"It's challenging it costs money for subscriptions if they don't have access to academic libraries, etc."* – Interview 4

Appendix B: Main themes, underlying codes, and examplar quotes *(continued)*

Theme	Supporting Codes	Exemplar Quotes
Journals' Target Audience	■ Impact on oral health professionals ■ Journal purpose and focus ■ Factors considered for open access	*"[Target audience is] I think that the kinds of practitioners who are, who are really engaged and open to making changes based on the latest evidence"* – Interview 4 *"Health professionals, it's pretty broad I mean it could be clinicians, which I would say most publications don't influence them greatly. Unless something truly remarkable is going on in the literature, I don't think most oral health professionals are accessing the literature routinely because it's challenging it costs money for subscriptions they don't have access to academic libraries, etc."* – Interview 4 *"Our intended impact is to either drive improvements in clinical practice, which then ultimately lead to improvements in oral health."* – Interview 3 *"I think there's also on us to communicate with the general public so that they can try and encourage and promote their own oral health to."* – Interview 4