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Research waste related editorial policies of leading dental journals:

Situation 2018

Running title: Research waste related to dental journals

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Research Waste Related Editorial Policies of Leading Dental Journals: Situation 2018

Abstract

Objectives: To study whether specific recommendations aimed at reducing avoidable research waste were included in the author instructions of leading dental journals.

Method: We identified 109 peer-reviewed and original research-oriented dental journals that were indexed in the MEDLINE and/or SCIE database in 2018. Two authors extracted independently information regarding the endorsement of reporting guidelines (RGs), ICMJE recommendations, trial or systematic review registration, as well as open access (OA) and data sharing policies.

Result: All 109 journals provided online “instructions to authors”, among which 64 journals (58.7%) mentioned RGs. The ICMJE recommendations were endorsed by 74 journals (67.9%), trial and systematic review registration were mentioned by 48 (44.0%) and 6 (5.5%) of the journals, respectively. In terms of open access, most journals stated they were Hybrid OA (82.0 %), Direct OA (15.4%); while data sharing policy was recommended by 32 (29.4%) journals. Statistical analyses suggest that these policies were more frequently mentioned by SCIE-indexed journals, higher-impact journals, and journals that endorsed the ICMJE recommendations.

Conclusion: Adequate reporting, OA and data sharing are important tools for enhancing research communication, translation and the reduction of avoidable research waste. However, currently they are not widely endorsed by dental journals.

1. Introduction

Biomedical research expends approximately a quarter of trillion US dollars yearly. Evidence suggests that a great extent of this sum is being avoidably wasted (Moher et al., 2016). Publications from 2009, 2014 and 2016 in The Lancet have primarily attributed this waste to imbalanced research questions, insufficient registration of clinical trials, failure of new research to systematically review previous findings in the same topic area, flawed study design and execution, nonpublication and lack of accessibility and sharing. These problems have led to an avoidable waste of 85% of all research funds in biomedicine, implying a global total loss of over US\$100 billion per year (Chalmers et al., 2014; Chalmers & Glasziou, 2009; Ioannidis, 2008; Moher et al., 2016).

Waste in research could be avoided if all studies are preceded by systematic assessment of existing evidence (Lund, Juhl, & Christensen, 2016). Systematic reviews often identify gaps in

the evidence base and provide a decision about whether and what additional primary research should be conducted (Egger & Smith, 1997; Glasziou P., 2015). Nevertheless, evidence indicates that researchers (Clarke & Chalmers, 1998; Clarke, Hopewell, & Chalmers, 2007; Glasziou P., 2015; Habre, Tramer, Popping, & Elia, 2014; Robinson & Goodman, 2011; Sawin & Robinson, 2016) and even high-quality clinical studies (Clarke & Chalmers, 1998; Clarke et al., 2007; Habre et al., 2014; Robinson & Goodman, 2011) published in most important medical journals often fail to use previous research findings when preparing, designing or discussing new research. Under citation of earlier research is a particularly problematic issue when the selection of earlier studies is biased (Gotzsche, 1987). An investigation of clinical trials performed over four decades revealed that, irrespective of the number of relevant previous trials, less than a quarter of previous studies have been cited in reports (Robinson & Goodman, 2011).

The prospective registration of protocols for clinical trials and systematic reviews is becoming a valuable tool for investigating what is already being researched (Booth et al., 2011). The prospective registration of clinical trials represents a key factor in reducing waste in research (Ioannidis et al., 2014) because it eliminates redundancy by distinguishing and therefore preventing unnecessary duplication of research and publications. However, only less than one-quarter of RCTs with results published in a sample of oral health journals (Smail-Faugeron, Fron-Chabouis, & Durieux, 2015) or general and specialty medicine studies (Wager & Williams, 2013) were registered with a public registry.

The active execution of reporting guidelines (RGs) for reporting different kinds of studies is one method that journals can utilise to help reduce waste due to poor reporting (Hopewell, Ravaud, Baron, & Boutron, 2012; Pandis, Shamseer, Kokich, Fleming, & Moher, 2014; Turner et al., 2012). During the last two decades, journal editors and methodologists have developed and published numerous RGs in an attempt to enhance research reporting and thereby facilitate critical appraisal and their inclusion in meta-research. In addition, the Enhancing the Quality and Transparency of Health Research (EQUATOR) network has worked since 2008 to enhance the reliability and value of medical research publications through the advancement of transparent and appropriate reporting (Simera et al., 2010). Unless research is properly reported, the time and resources invested in its conduct are wasted.

The development of open access (OA) (Joseph, 2013) is also an important and suggested method for reducing avoidable waste in biomedical research (Chalmers & Glasziou, 2009). OA may enrich education, accelerate research and provide advantages to all stakeholders, including

researchers and practitioners, particularly those in resource-poor institutions and low-income countries (Clauson, Veronin, Khanfar, & Lou, 2008; Giglia, 2010). The appreciation of 85% of research waste refers only to activities prior to the point of publication. However, considerable waste occurs after publication due to poor access, poor dissemination and poor research finding uptake (Glasziou, 2014). The main beneficiaries of dental and medical research include not only researchers but also clinicians, patients and policy-makers who usually have limited access to full articles behind the pay wall (Kurata, Morioka, Yokoi, & Matsubayashi, 2013; Moorhead, Holzmeyer, Maggio, Steinberg, & Willinsky, 2015). Therefore, development of OA in research (Joseph, 2013) is important for reducing post publication waste. Solving the problems of prepublication waste and post publication access could considerably accelerate medical research.

Sharing research data has attracted increasing interest because associating large healthcare datasets allow enriching data on symptoms, diagnoses diseases, treatments and prescriptions, in addition to providing increased effectual semantic access to the evidence base (Kostkova et al., 2016). Data sharing could reduce research waste by enabling new types of research. For example, meta-analyses using individual patient data from published clinical trials have revealed numerous novel findings that go well beyond the limitations of original studies that generated the data (Fournier et al., 2010). Policies directing researchers to share data in biomedical research are also becoming commonplace (Wellcome Trust, 2016).

In 2014, The Lancet published a series of five reviews (Al-Shahi Salman et al., 2014; Chalmers et al., 2014; Chan et al., 2014; Glasziou et al., 2014; Ioannidis et al., 2014) showing ways to minimise waste and increase value in biomedical research. Seventeen recommendations were provided to five key stakeholders of medical research, namely, academic institutions, journals, regulators, funders, and researchers. Journals are recommended to improve their editorial policies and provide specific guidance to researchers through their content and websites. In 2015, Moher et al. (Moher et al., 2016) investigated the editorial policies of leading medical journals by focusing on 10 core questions that are related to research waste. A survey of dental journal editors conducted by Hua et al. (Hua, Walsh, Glenny, & Worthington, 2016) in 2016 provided thorough information regarding the use of RGs in dentistry. Hence, to our knowledge, whether and to what extent dental journals have adopted editorial policies that can reduce avoidable research waste remains unclear. Therefore, the objectives of this methodological study were to investigate the current usage of research waste-related policies by leading dental journals and to explore factors associated with such usage.

2. Materials and Methods

2.1. Sample Creation

2.1.1 Selection of Journals

We set out to include all main dental journals (indexed in MEDLINE and/or SCIE) that were active, peer reviewed and original research oriented.

2.1.2 Selection of RGs and ICMJE Recommendations

A list of main RGs and ICMJE recommendations relevant to dental research was developed *a priori* to ensure the comprehensiveness and relevance of this study. In November 2018, the authors recognised main and potentially relevant RGs and ICMJE recommendations by screening them in the online RG library of the EQUATOR Network and ICMJE. Discrepancies were resolved by discussion. Twenty-three RGs or RG extensions and two items of the ICMJE Recommendations were included (Tables 1 and 2)

2.1.3 Survey of Journal Instructions

For each of included journal, an electronic search was conducted from November 29 to December 2, 2018 to identify any ‘instructions to authors’.

From each of the obtained instructions, the following predetermined information (Moher et al., 2016) was extracted by B.A. and independently verified by Y.L.:

- Does the instruction explicitly mention RGs and/or the EQUATOR Network? If mentioned, what are the endorsement level and the reference given?
- Does the instruction mention the registration of clinical trials or systematic reviews?
- Does the instruction mention the use of systematic reviews as part of the research context?
- Does the instruction mention ICMJE recommendation?
- Does the journal mention any policy related to OA?
- Does the journal include any policy on public access to data from published research?

The endorsement of mentioned RGs and related policies was categorised as follows (Knuppel, Metz, Meerpohl, & Strech, 2013; Meerpohl, Wolff, Antes, & von Elm, 2011; Meerpohl, Wolff, Niemeyer, Antes, & von Elm, 2010):

- Recommended: The RG/policy should be considered or used (e.g. ‘should...’, ‘please...’, ‘we recommend/ encourage authors/reviewers to...’).
- Required: The RG/policy is a condition for publication (e.g. ‘authors must...’, ‘authors are required to...’, ‘we expect authors to...’).

Regarding the trial registration policy, each journal was categorised into one of two predetermined groups: 1) journals requiring or recommending trial registration (as a precondition for publication in the context of general manuscript preparation) and 2) journals providing no reference to trial registration (Smail-Faugeron et al., 2015).

OA policies (Hua, Shen, Walsh, Glenny, & Worthington, 2017) were categorised into three

types *a priori*:

- 1) Direct OA: Journals that were fully OA and without any embargo.
- 2) Hybrid OA: Journals that were subscription-based and that offered researchers the option to publish their work as Gold OA (Gold OA is broadly defined as providing OA articles through journals or publishers) if they paid a specified publication fee ‘hybrid journals.’
- 3) Green only: Journals that did not provide an option for Gold OA but allowed the authors to make their work OA via self-archiving (Green OA).

When the journal’s instructions to the author did not contain any information about OA, policy was documented in accordance with the Sherpa Romeo website. When the journal’s instructions to authors contained policy but was inconsistent with the Sherpa Romeo website, policy was documented in accordance with instructions that were more recently updated than the Sherpa Romeo website.

Data-sharing policy was categorised into 1) Recommended: The data-sharing policy should be considered or used (e.g. ‘should...’, ‘please...’, ‘we recommend/encourage authors/reviewers to...’). 2) Required: The data-sharing policy is a condition for publication (e.g. ‘authors must...’, ‘authors are mandating to...’, ‘we expect authors to...’).

2.2. Statistical Analyses

For the journal instruction survey, descriptive statistics were used to summarise the endorsement of each policy. Chi-square test was used to test the significance of differences amongst the types of dental journals as either general or specialty; amongst the specific subject of dental journal; whether the dental journal was indexed in SCIE or not; whether the journal had an impact factor or not; whether journals had an OA policy or not and whether the journal endorsed the ICMJE recommendation or not. Data were entered and analysed using the statistical package for social services Version 24 (Armonk, NY: IBM Corp.) for Windows software.

3. Results

3.1. Characteristics of Included Journals

A total of 169 unique journals were initially identified in the electronic databases, with 109 remaining after the implementation of eligibility criteria (Figure 1). The titles of the journals and the summary of the characteristics of the journals are shown in (Tables 3 and 4).

3.2. Instructions to Authors

All journals (n = 109) included in our study provided online instructions for authors. Amongst the Twenty-three RGs that were deemed important for dental research, nine were never mentioned (Table 5).

3.2.1 Endorsement of RGs

A total of 64 journals (58.7%) mentioned RGs (Figure 2). The guidelines were mentioned in Consolidated Standards of Reporting Trials (CONSORT, 49.6%), Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA, 27.5%), Animal Research: Reporting of *In*

Vivo Experiments (23.9%) and Strengthening the Reporting of Observational Studies in Epidemiology (STROBE, 20.2%; Table 5). In addition to the 23 prespecified RGs, seven journals (6.4%) mentioned relevant Cochrane Collaboration guidelines as RGs for systematic reviews; three journals mentioned the Minimum Information about a Microarray Experiment guideline (MIAME); one journal mentioned the Transparent Reporting for Individual Prognosis or Diagnosis guideline (TRIPOD); and one journal mentioned the Consolidated Health Economic Evaluation Reporting Standards guideline (CHEERS). Notably, the Quality of Reporting of Meta-analyses guideline (QUOROM), an obsolete guideline replaced by PRISMA in 2009, was still endorsed by five journals (4.5%). RGs were frequently mentioned by journals indexed in SCI ($P = 0.095$), journals with OA ($P < 0.001$), journals with high impact factors ($P = 0.026$) and journals that endorsed ICMJE recommendations ($P < 0.001$) (Table 6).

3.2.2 Mentions of Online RG Libraries

Seventeen (15.6%) and three (2.8%) journals mentioned the EQUATOR Network and Minimum Information for Biological and Biomedical Investigations (MIBBI) websites, respectively. Amongst the 17 journals that mentioned the EQUATOR Network, 10 provided the website URL as reference (Table 7).

3.2.3 Endorsement of the Registration Policy

Overall, 48 (44.0%) journals referred to trial registration (Figure 2) as either 32 required (66.7%) or 16 recommended (33.3%) trial registrations, and 61 (56.0%) provided no reference to trial registration (Table 8). Journals indexed in SCI ($P = 0.015$), journals with high impact factors ($P = 0.007$), journals with OA ($P < 0.001$) and journals that endorsed ICMJE recommendations ($P < 0.001$) (Table 6) were likely to require or recommend trial registration. However, the prospective registration of systematic reviews was mentioned only by six (5.5%) of all journals.

3.2.4 Endorsement of ICMJE Recommendations

Seventy-four journals (67.9%) mentioned ICMJE recommendations (Figure 2). Amongst these journals, 32 (43.2%) used the title Uniform Requirements for Manuscripts Submitted to Biomedical Journals (URM), which is out of date and thus inappropriate; 10 (13.5%) referred to the content of the manuscript preparation section of the ICMJE recommendations; and 18 (16.5%) referred to the trial registration (Table 9). ICMJE was frequently mentioned by journals indexed in SCI ($P = 0.069$), journals with OA ($P = 0.027$) and journals with high impact factors ($P = 0.109$, Table 6).

3.2.5 Endorsement of OA

Three policies were identified regarding OA publishing. Firstly, 31 (28.4%) journals (Figure 2) did not offer any form of OA publishing to researchers in their instructions to the author and in the supplementary website of Sherpa Romeo (www.sherpa.ac.uk). Secondly, 64 (82.0%) subscription-based journals offered researchers the option to publish their work as OA if they paid a specified publication fee. Such journals were often termed 'hybrid OA.' Thirdly, 12 (15.4%) journals were 'direct OA.' Lastly, two (2.6%) journals allowed the authors to make

their work OA via self-archiving and were considered ‘green OA.’ Therefore, 78 journals (71.6%) offered some form of OA option (Table 10). The median article processing fees of these journals were \$2355. OA was frequently mentioned by journals indexed in SCI ($P < 0.001$), journals with high impact factors ($P < 0.001$) and journals that endorsed ICMJE recommendations ($P = 0.006$) (Table 6).

3.2.6. Endorsement of data sharing.

Thirty-two (29.4%) journals mentioned their research data policy (Figure 2), and half of them (14.7%) referred to Mendeley as the database for data sharing. A total of 30 journals (93.8%) recommended research data policy, whereas two journals (6.2%) requested data sharing in their author instructions. However, only 17 journals (53.1%) provided the corresponding website URL as reference (Table 11). Data-sharing policy was frequently mentioned by journals indexed in SCI ($P = 0.156$), journals with high impact factors ($P = 0.275$), journals with OA ($P < 0.001$) and journals that endorsed ICMJE recommendations ($P = 0.017$) (Table 6).

4. Discussion

The ultimate goal of dental research is to discover and disseminate novel high-quality data to the community. However, some studies published in dentistry journals are often compromised by either incomplete reporting (Papageorgiou & Cobourne, 2018), and access to research reports is restricted even when studies are adequately reported. To address these issues, efforts are needed to improve all stages of research production and dissemination from the conception of research questions to the full and accessible publication of research findings.

4.1 RGs and ICMJE recommendations

Although the adoption of RGs, such as CONSORT, PRISMA and STARD, has helped improve the quality of research reports, substantial gaps remain (Glasziou et al., 2014). This study found low endorsement rates of RGs (58.7%, particularly for those other than CONSORT) in the instructions to authors of dental journals. However, our results revealed progress in the endorsement of RGs. By contrast, a 2015 survey (Hua et al., 2016) of journal instructions to authors showed that references or recommendations for the use of RGs during reviews was low (55 [50.5%] of 109 journals assessed).

ICMJE provides recommendations to review best practices and ethical standards in the conduct and reporting of research and other materials published in medical journals. However, the authority to monitor or enforce these recommendations does not exist. Therefore, ethical recommendations should be used in conjunction with journal’s instructions for authors (ICMJE, 2018).

This study emphasised several important issues with regard to the ethical policies recommended by ICMJE. A total of 74 journals (67.9%) mentioned ICMJE recommendations. Amongst these journals, 32 (43.2%) used the title URM, and 10 (13.5%) referred to the content of the manuscript preparation section of ICMJE recommendations. Our study demonstrates progress in the endorsement of ICMJE recommendations compared with another study wherein researchers used a methodology similar to that used here. The previous study analysed 109 leading dental journals, and the authors reported that ICMJE recommendations were mentioned by 65 (59.6%) of dental journals (Hua et al., 2016).

4.2 Trial and Systematic Registration

The International Prospective Register of Systematic Reviews was launched in February 2011 (Booth et al., 2012). The prospective registration of protocols for clinical trials and systematic reviews is becoming increasingly available. This tool can help assess what is already being researched (Booth et al., 2011), minimise the unplanned duplication of reviews and serve to discourage bias in the conduct and reporting of systematic reviews. The level of compliance and endorsement with trial and systematic review registration varied and was generally low in dental journals (De Angelis et al., 2004). Our study found that 44.0% and 5.5% of the selected dental journals required or recommended trial and systematic review registration, respectively, in their author guidelines. Our results are in agreement with those of previous studies on oral health journals (Smail-Faugeron et al., 2015) and to those on general or specialty medicine studies (Wager & Williams, 2013).

4.3 Systematic Contexts

When decisions about additional primary research are made, research funders and regulators should request that proposals for additional primary research be advocated by systematic reviews of what is already known and increase funding for the necessary syntheses of existing evidence (Health., 2001). Such demands will be effective in setting research priorities and address the sources of avoidable waste. In addition, the existence of previous research must be estimated to avoid unnecessary duplication. The reasonable updating of an existing systematic review with the results of the latest primary study may be justified in confirming previous results or to assess the generalizability of novel findings (Ioannidis, 2014). Nevertheless, unnecessary duplication is usually associated with waste (Chalmers & Glasziou, 2009). Replications become unnecessary duplication either when systematic reviewers are unconscious of what their colleagues are planning or in the presence of pressure to publish for career progression. Consequently, in recent years, the increased drive for the international endorsement of the register by funders and journals (Davies, 2012), published research protocols, OA publication and improved training for peer reviewers may help reviewers examine identified protocols and reduce unnecessary duplication. When research findings are reported, they should be set in the context of previous analyses or similar research. Some journals are starting to require this information when prospective authors submit the results of their research (Kleinert, Benham, Collingridge, Summerskill, & Horton, 2014). According to a recent study (Moher et al., 2016), several medical journals have endorsed this policy in their instructions to author, whereas no dental journal has done this. If dental journals follow this behaviour, then the value of scientific research will increase, and waste that originates from seeking to answer research questions that had been answered reliably by previous conducted research would be avoided.

4.4 OA and Data Sharing

This study highlights the development of OA publication in leading dental journals with the vast majority (71.6 %) of journals studied offering authors an OA option. These journals included hybrid OA (82.0%), direct OA (15.4%) and green OA (2.6%). Interestingly, more than half of the journals included in our study support the gold OA (hybrid OA and direct OA), which has the best accessibility for reducing research waste because early availability and dissemination may improve the time relevance of articles, accelerate the progress of research and benefit all direct and indirect users of research (e.g. patients) (Giglia, 2010; Livas, Pandis, & Ren, 2015).

Common and prompt data sharing decreases the unnecessary duplication of research and reduces the waste of resources (Pham-Kanter, Zinner, & Campbell, 2014). Research funders (Council, 2016) and biomedical journals (Groves, 2010; Nature.com) try to impede the desire to hide data by adopting policies that mandate data sharing. One step in encouraging data sharing in dentistry is to know how many journals promote and accept data affiliated with manuscripts and how datasets are deposited. In this study, we found low endorsement rates (29.4%) of data-sharing policies, and 68.8% of these journals had a statement about data availability. These percentages are similar to those found in previous studies that analysed the public availability of research published in the Library and Information Science Journals (Aleixandre-Benavent R, 2016) and in the Substance Abuse Data Journals (Aleixandre-Benavent et al., 2014). Another study found that 88% of high-impact journals (Alsheikh-Ali, Qureshi, Al-Mallah, & Ioannidis, 2011) had a declaration in their instructions to authors related to the public availability and sharing of data.

The findings of our study regarding the positive association between the mentioning of these policies and SCIE-indexed journals, high-impact journals, OA journals and journals that endorsed ICMJE recommendations are similar to those of previous studies (Hua et al., 2016; Piwowar & Chapman, 2008).

Continuing efforts to engage research in wasteful behaviour are serious threats to science worldwide. Findings from a 2009 study proposed that at least 50% of research reports were poorly reported and therefore unusable (Chalmers & Glasziou, 2009). Estimating the general losses in research reporting revealed that approximately 50% loss at this stage would result in loss of more than 85%, implying that the dividends from tens of billions of dollars of investment in research are lost every year because of correctable problems. The research waste of 85% refers only to activities prior to the point of publication. Additional waste occurs after publication due to poor access, poor dissemination and poor uptake research finding. This waste can also lead to redundant, misguided or potentially harmful research when assessing similar interventions.

4.5 Strengths and Limitations

To our knowledge, this study is the first to assess policies related to the research waste of studies published in leading dental journals and to explore factors associated with usage. Given that our sample incorporated journals that were indexed in MEDLINE but not in SCIE, our sample was already more comprehensive than those of previous studies on editorial policies in dentistry (Faggion, 2011; Smail-Faugeron et al., 2015) and other medical specialties (Knuppel et al., 2013; Kunath F, 2012; Meerpohl et al., 2010).

Despite these strengths, the limitation of our study is that the initial observations were partly based on checking websites that were often difficult to handle. Likewise, we could have missed information or some of the content that might have been changed since our investigation. For example, on some journal websites, instructions to authors are modified at the beginning of the calendar year. Therefore, cautious interpretation is needed.

5. Conclusions

The results of this study indicate the following:

- 1) Although the development and application of registration, RGs, OA and data-sharing policies have resulted in some progress in biomedical research, these policies are not widely endorsed

by dental journals.

- 2) All stages of production and dissemination in medical research avoidable waste. Dental research can be improved, and waste in dental and medical research can be minimised by adopting editorial policies that provide an accessible, unbiased and comprehensive evidence pool to all stakeholders.
- 3) Behavioural changes from researchers, publishers and regulators will be needed to maximise waste reduction in research.

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Declaration of Interest

None

Tables

Table 1. Key reporting guidelines (RGs) relevant to dental research.

No.	RGs	Publication
1	CONSORT (<i>Consolidated Standards of Reporting Trials</i>) CONSORT extensions	(Moher et al., 2010)
2	for abstracts	(Hopewell et al., 2008)
3	for cluster randomized trials	(Campbell, Piaggio, Elbourne, & Altman, 2012)
4	for noninferiority and equivalence randomized trials	(Piaggio, Elbourne, Pocock, Evans, & Altman, 2012)
5	for harms	(Ioannidis et al., 2004)
6	for patient-reported outcomes	(Calvert et al., 2013)
7	for within-person trials	(Pandis, Chung, Scherer, Elbourne, & Altman, 2017)
8	SPIRIT (<i>Standard Protocol Items - Recommendations for Interventional Trials</i>)	(Chan et al., 2013)
9	PRISMA (<i>Preferred Reporting Items for Systematic Reviews and Meta-Analyses</i>) PRISMA extensions	(Moher, Liberati, Tetzlaff, & Altman, 2009)
10	for abstracts	(Beller et al., 2013)
11	for DTA	(McInnes et al., 2018)
12	for harms	(Zorzela et al., 2016)
13	for network analyses	(Hutton et al., 2015)
14	for protocols	(Moher et al., 2015)
15	MOOSE (<i>Meta-analysis Of Observational Studies in Epidemiology</i>) STROBE (<i>Strengthening the Reporting of Observational Studies in Epidemiology</i>)	(Stroup et al., 2000)
16		(von Elm et al., 2007)
17	STARD (<i>STAndards for Reporting of Diagnostic accuracy studies</i>)	(Bossuyt et al., 2015)
18	CARE (<i>CAse REport</i>) TREND (<i>Transparent Reporting of Evaluations with Nonrandomized Designs</i>)	(Gagnier et al., 2013)
19		(Des Jarlais, Lyles, & Crepaz, 2004)
20	COREQ (<i>COnsolidated criteria for REporting Qualitative studies</i>) ARRIVE (<i>Animal Research - Reporting of In Vivo Experiments</i>)	(Tong, Sainsbury, & Craig, 2007)
21		(Kilkenny, Browne, Cuthill, Emerson, & Altman, 2010)
22	STREGA (<i>STrengthening the REporting of Genetic Association studies</i>)	(Little et al., 2009)
23	STROBE-ME (<i>STrengthening the Reporting of OBservational studies in Epidemiology – Molecular Epidemiology</i>)	(Gallo et al., 2011)

Table 2. Key International Committee of Medical Journal Editors (ICMJE) Recommendations.

ICMJE Recommendation	Definition	Publication
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Manuscript section	preparation	Manuscripts should follow the style that detailed in the International Committee of Medical Journal Editors’ revised ‘Uniform Requirements for Manuscripts Submitted to Biomedical Journals. (ICMJE, 2018)
Trial registration		Registration in a public trials registry is a condition for publication of clinical trials in accordance with International Committee of Medical Journal Editors recommendations. Trials must register at or before the onset of patient enrolment.

[illegible]

[illegible]

61	J Clin Periodontol		γ						
62	J Contemp Dent Pract								
63	J Craniomaxillofac Surg		γ						α
64	J Dent		γ						α
65	J Dent Child (Chic)				β				
66	J Dent Educ				α				
67	J Dent Res	✓	γ				γ		γ
68	J Dent Sci		γ						α
69	J Endod		γ						α
70	J Esthet Restor Dent								
71	J Evid Based Dent Pract								α
72	J Indian Soc Pedod Prev Dent		α						
73	J Investig Clin Dent		γ						
74	J Oral Facial Pain Headache								
75	J Oral Implantol								
76	J Oral Maxillofac Surg		β				α		
77	J Oral Pathol Med		γ		α				
78	J Oral Rehabil	✓	γ		β		α	γ	α
79	J Oral Sci								
80	J Orofac Orthop								
81	J Orthod		γ		α				
82	J Periodontal Implant Sci								
83	J Periodontal Res		γ						
84	J Periodontol		γ						
85	J Prosthet Dent								
86	J Prosthodont								
87	J Prosthodont Res		α						α
88	J Public Health Dent		γ				α		
89	J Stomatol								α
90	Oral Maxillofac Surg								
91	Korean J Orthod								
92	Med Oral Patol Oral Cir Bucal								
92	Mol Oral Microbiol	✓	✓ α		α α		α		α

√: The corresponding online RG library mentioned; α: Adherence to RG recommended but not required; β: Adherence to RG required but submission of relevant checklist/flow diagrams not required; γ: Both adherence to RG and submission of relevant checklist/flow diagrams required.

^bMentioning of the MIBBI Portal.

For each RG number, see the corresponding RG title in Table 1

Table 4. Characteristics of included journals.

Characteristic	Category	N	%
Type	General dental journal	33	30.2
	Specialty dental journal	76	69.7
Subject	Dentistry	33	30.3
	Dental Public Health	4	3.7
	Endodontics	5	4.6
	Oral and Maxillofacial Surgery	10	9.1
	Orthodontics	10	9.1
	Paediatric Dentistry	7	6.4
	Periodontics	7	6.4
	Prosthodontics	9	8.3
	Restorative Dentistry	4	3.7
	Dental Materials	3	2.8
	Other	17	15.6
SCIE Indexed	Yes	86	78.9
	No	23	21.1
Impact Factor	Unavailable	24	22.1
	≤1	11	10
	1 - 2	45	41.3
	2 - 3	19	17.4
	≥3	10	9.1
Open Access	Yes	78	71.6
	No	31	28.4
Total		109	100

N: number of journals.

Table 5. Endorsement of Each Specific Reporting Guideline in Instructions for Authors (N = 109 Journals).

Reporting Guideline	Mentioned, n (%)		Level of Endorsement, n (%)			Reference, n(%) ^a	
	No	Yes	Recommended	Required	Submission ^b	Reference Given	Website URL Given
CONSORT	56 (51.4)	53 (49.6)	15 (13.7)	7 (6.4)	31(28.5)	33 (62.3)	19 (35.8)
CONSORT extensions							
For abstract	105 (96.3)	4 (3.7)	4 (3.7)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)
For CRT	107 (98.2)	2 (1.8)	2(1.8)	0 (0.0)	0 (0.0)	0(00.0)	0 (00.0)
For noninferiority trials	107 (98.2)	2 (1.8)	1 (0.9)	0 (0.0)	0 (0.0)	0 (00.0)	0 (00.0)
For harms	109 (100)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
For PRO	109 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
For within-person trials	109 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
SPIRIT	103 (94.5)	6 (5.5)	4 (3.7)	0 (0.0)	2 (1.8)	0 (0.0)	5 (83.3)
PRISMA	79 (72.5)	30 (27.5)	15 (13.8)	8 (7.4)	7 (6.4)	11 (36.7)	14 (46.7)
PRISMA extensions							
For abstract	109 (100)	(0.0) 0	(0.0) 0	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
DTA	109 (100)	(0.0) 0	(0.0) 0	(0.0) 0	(0.0) 0	0 (0.0)	0 (0.0)
harm	109 (100)	(0.0) 0	(0.0) 0	(0.0) 0	(0.0) 0	0 (0.0)	0 (0.0)
Network analysis	109 (100)	(0.0) 0	(0.0) 0	(0.0) 0	(0.0) 0	0 (0.0)	0 (0.0)
For protocol	105 (96.3)	4 (3.7)	4 (3.7)	(0.0) 0	(0.0) 0	0 (0.0)	3 (75.0)
MOOSE	105 (96.3)	4 (3.7)	3 (2.8)	0 (0.0)	1 (0.9)	0 (0.0)	1 (25.0)
STROBE	87 (79.8)	22 (20.2)	14(12.8)	2(1.8)	6(5.5)	9 (41.0)	8 (36.4)
STARD	98 (89.9)	11 (10.1)	8 (7.3)	0 (0.0)	3 (2.8)	2 (18.2)	6 (54.5)
CARE	103 (94.5)	6 (5.5)	3 (2.7)	0 (0.0)	3 (2.7)	0 (00.0)	5 (83.3)
TREND	108 (99.1)	1 (0.9)	1 (0.9)	0 (0.0)	0(0.0)	0 (00.0)	0 (00.0)
COREQ	104 (95.4)	5 (4.6)	4 (3.7)	0 (00.0)	1 (0.9)	0 (00.0)	4 (80.0)
ARRIVE	83 (76.1)	26 (23.9)	20 (18.3)	2 (1.8)	4 (3.7)	4 (16.0)	19 (73.0)
STREGA	109 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
STROBE-ME	109 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

ARRIVE, Animal Research: Reporting of In Vivo Experiments; CARE, Case Report; CONSORT, Consolidated Standards of Reporting Trials; COREQ, Consolidated Criteria for Reporting Qualitative Studies; CRT, cluster randomized trials; MOOSE, Meta-analysis of Observational Studies in Epidemiology; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-analyses; DTA, Preferred Reporting Items for a Systematic Review and Meta-analysis of Diagnostic Test Accuracy Studies ; PRO, patient-reported outcomes; STARD, Standards for Reporting of Diagnostic Accuracy Studies; STREGA, Strengthening the Reporting of Genetic Association Studies; STROBE, Strengthening the Reporting of Observational Studies in Epidemiology; STROBE-ME, Strengthening the Reporting of Observational Studies in Epidemiology–Molecular Epidemiology; TREND, Transparent Reporting of Evaluations with Nonrandomized Designs.^aThe proportion among those mentioned the corresponding reporting guideline.^bBoth adherence to the reporting guideline and submission of relevant checklists/flow diagrams required.

Table 6. Mentioning of Each Policy in the Instructions to Authors (N = 109 Journals).

Characteristic: Category	Total <i>n</i>	Reporting %	guideline <i>P</i> Value ^a	<i>n</i>	Trial registration %	<i>P</i> Value ^a	<i>n</i>	%	ICMJE <i>P</i> Value ^a	<i>n</i>	%	OPEN ACCESS <i>P</i> Value ^a	<i>n</i>	%	Data sharing <i>P</i> Value ^a	
Dental journal																
General	33	20	60.6	0.792	15	45.5	0.844	21	63.6	0.351	23	69.7	0.776	10	30.3	0.886
Specialty	76	44	57.9		33	43.4		53	69.7		53	72.4		22	28.9	
Subject																
Dentistry	33	20	60.6	0.082	15	45.5	0.235	21	63.6	0.331	23	69.7	0.341	10	30.3	0.223
Dental public	4	3	75.0		2	50.0		3	75.0		2	50.0		0	0.0	
health																
Endodontics	5	5	100.0		2	40.0		5	100.0		5	100.0		2	40.0	
Oral and	10	7	70.0		7	70.0		9	90.0		9	90.0		7	70.0	
maxillofacial																
surgery																
Orthodontics	10	6	60.0		4	40.0		5	50.0		7	70.0		2	20.0	
Pediatric dentistry	7	4	57.1		1	14.3		4	57.1		3	42.9		2	28.6	
Periodontics	7	5	71.4		5	71.4		5	71.4		6	85.7		1	14.3	
Prosthodontics	9	2	22.2		2	22.2		5	55.6		5	55.6		2	22.2	
Restorative	4	0	0.0		1	25.0		2	50.0		2	50.0		0	0.0	
dentistry																
Dental materials	3	1	33.3		0	0.0		1	33.3		2	66.7		1	33.3	
Other	17	11	64.7		9	52.9		14	82.4		14	82.4		5	29.4	
SCIE indexed																
Yes	86	54	62.8	0.095	43	50.0	0.015	62	72.1	0.069	69	80.2	<0.001	28	32.6	0.156
No	23	10	43.5		5	21.7		12	52.2		9	39.1		4	17.4	
Impact factor																
Unavailable	24	11	45.8	0.026	6	25.0	0.007	13	54.2	0.109	10	41.7	<0.001	5	20.8	0.275
≤1	11	4	36.4		1	9.1		5	45.5		4	36.4		1	9.1	
1 to 2	45	25	55.6		23	51.1		33	73.3		36	80.0		14	31.1	
2 to 3	19	16	84.2		11	57.9		16	84.2		18	94.7		8	42.1	
≥3	10	8	80.0		7	70.0		7	70.0		10	100.0		4	40.0	
Open access																
Yes	72	51	70.8	<0.001	42	58.3	<0.001	54	75.0	0.027				32	44.4	<0.001
No	37	13	35.1		6	16.2		20	55.1					0	0.0	
ICMJE mentioned																
Yes	74	56	75.7	<0.001	46	62.2	<0.001				59	79.7	0.006	27	36.5	0.017
No	35	8	22.9		2	5.7					19	54.3		5	14.3	
Total	109	64	58.7		48	44.0		74	67.9		78	66.1		32	29.4	

ICMJE, International Committee of Medical Journal Editors. ^aChi-square tests.

Table 7. Information regarding online reporting guideline libraries in instructions for authors (n=109).

Library	Category	N	%
EQUATOR Network	Not mentioned	92	84.4
	Mentioned	17	15.6
	<i>Reference given</i>	6	35.2 ^a
	<i>Website URL given</i>	10	58.8 ^a
MIBBI Portal	Not mentioned	106	97.2
	Mentioned	3	2.8
	<i>Reference given</i>	3	100.0 ^a
	<i>Website URL given</i>	3	100.0 ^a

Table 8. Trial registration

registration	Category	N	%
Trial registration	Not mentioned	61	56.0
	Mentioned	48	44.0
	Recommended	16	33.3 ^a
	Required	32	66.7 ^a
Systemic review	Not mentioned	103	94.5
	Mentioned	6	5.5

^aThe proportion among those that mentioned the trial registration.

Table 9. Endorsement of in instructions for authors (n=109)

ICMJE Recommendation	N	%
Not mentioned	35	32.1
Mentioned	74	67.9
Reference given	43	58.1 ^a
Website URL given	15	20.3 ^a

Inappropriate title(URM)	32	43.2 ^a
Referred to its manuscript preparation section	10	13.5 ^a
Trial registration	18	16.5

ICMJE: International Committee of Medical Journal Editors.

N: number of journals.

URM: Uniform Requirements for Manuscripts submitted to biomedical journals.

^aThe proportion among those that mentioned the ICMJE Recommendations.

Table 10. Information regarding open access policy in instructions for authors (n=109).

	Category	N	%
Open access	Not mentioned	31	28.4
	Mentioned	78	71.6
	Direct OA	12	15.4 ^a
	Hybrid OA	64	82.0 ^a
	Green only	2	2.6 ^a

^bThe proportion among those that mentioned the open access policies.

Table 11. Information regarding data sharing policy in instructions for authors (n=109).

	Category	N	%
Data sharing	Not mentioned	77	70.6
	Mentioned	32	29.4
	Recommended	30	93.8 ^a
	Required	2	6.2 ^a
	<i>Reference given</i>	17	53.1 ^a
Data available statement	Not mentioned	87	79.8
	Mentioned	22	20.2
	<i>Reference given</i>	17	77.3 ^a

a The proportion among those that mentioned the data sharing policy.

Figure Legends

Figure 1. Flow diagram for journal selection.

Figure 2. Proportion of mentioning for each editorial policy in the included instructions for authors (n=109).

Footnotes:

- 1. Does the instruction explicitly mention reporting guidelines and/or EQUATOR Network? If mentioned, what the level of endorsement and the reference given?*
- 2. Does the instruction mention the registration of clinical trial?*
- 3. Does the instruction mention the registration of systematic reviews?*
- 4. Does the instruction mention use of systematic reviews as part of research context?*
- 5. Does the instruction mention the ICMJE Recommendation?*
- 6. Does the journal mention anything or have policies about open access?*
- 7. Does the journal include any policy on public access to data from completed research?*

Figure 1. Flow diagram for journal selection.

Figure 2. Proportion of mentioning for each editorial policy in the included instructions for authors (n=109).

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