PRISMA for abstracts: best practice for reporting abstracts of systematic reviews in Endodontology.

Abstract

An abstract is a brief overview of a scientific, clinical or review manuscript as well as a stand-alone summary of a conference abstract. Scientists, clinician-scientists and clinicians rely on the summary information provided in the abstracts of systematic reviews to assist in subsequent clinical decision-making. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for Abstracts checklist was developed to improve the quality, accuracy and completeness of abstracts associated with systematic reviews and meta-analyses. The PRISMA for Abstracts checklist provides a framework for authors to follow, which helps them provide in the abstract the key information from the systematic review that is required by stakeholders. The PRISMA for Abstracts checklist contains 12 items (title, objectives, eligibility criteria, information sources, risk of bias, included studies, synthesis of results, description of the effect, strength and limitations, interpretation, funding and systematic review registration) under six sections (title, background, methods, results, discussion, other). The current article highlights the relevance and importance of the items in the PRISMA for Abstracts checklist to the specialty of Endodontology, while offering explanations and specific examples to assist authors when writing abstracts for systematic reviews when reported in manuscripts or submitted to conferences. Strict adherence to the PRISMA for Abstracts checklist by authors, reviewers, and journal editors will result in the consistent publication of high-quality abstracts within Endodontology.

Keywords

Abstracts, Endodontics, systematic review, meta-analyses.

Introduction

The primary aim of an abstract associated with a research or clinical manuscript and an abstract for a conference (e.g. poster, oral presentation) is to provide a precise but brief overview of the work, allowing the reader to have a general understanding of the article without having to read the entire paper (Beller *et al.* 2013). In addition to these obvious aims, electronic databases, such as Medline (PubMed)(https://www.ncbi.nlm.nih.gov/pubmed/), Scopus (https://www.scopus.com/), LILACS (https://bvsalud.org/) use algorithms to automatically categorize papers in their archives and repositories based on the information contained in abstracts (Hartley 2000, Grewal *et al.* 2016). The importance of an abstract is further emphasized as papers published in various languages generally make an additional abstract available in English in order to assist in disseminating the manuscript to a larger audience to create more impact and reach (Amano *et al.* 2016).

Abstracts can be structured or unstructured. "Structured abstracts" were proposed by the Ad Hoc Working Group for Critical Appraisal of the Medical Literature (Haynes *et al.* 1990) with the recommendation they should contain various sections identified by subheadings. For example, sections for original clinical research studies often include: objective, basic research design, clinical setting, participants, interventions, main outcome measurements, results, and conclusions. For literature reviews the sections are often: objective, data sources, methods of study selection, data extraction and synthesis, and conclusions (Haynes *et al.* 1990). The standardization of abstracts achieved via a structured approach is a major advantage and facilitates a better understanding of the manuscript whilst at the same time compelling authors to provide the information in a logical sequence. When written well, structured abstracts are more comprehensive, complete, contain more information, can be read more easily, are easier to recall and facilitate their peer review for conference submissions compared to unstructured abstracts (Hartley 2004, 2014). In addition, Bayley & Eldredge (2003) reported that a structured abstract helped to improve the empirical study design.

Time constraints, limited access to journals and language barriers can prevent individuals reading the full text of articles. Thus, an abstract must stand-alone and provide a clear summary of the full text of a publication. Unfortunately, Pitkin *et al*. (1999) reported that the data and content of an abstract in medical journals were often not consistent with the full text of the article. Similar deficiencies have been reported in Psychology and Pharmacy journals (Harris *et al.* 2002, Ward *et al.* 2004).

Researchers, clinicians, consumers and policy makers depend on the information provided in the abstracts of systematic reviews (Hartley 2000). Although a structured abstract has the potential to improve the quality of an abstract, several shortcomings have been identified, especially for research related to clinical trials and systematic reviews. Indeed, the quality and completeness of abstracts for systematic reviews have been reported to be suboptimal in journals in the fields of General Medicine (Bigna *et al*. 2016), Periodontology (Faggion *et al*. 2014) and Oral Implantology (Kiriakou *et al.* 2013).

The Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) statement established guidelines for the reporting of systematic reviews and meta-analyses (Moher *et al*. 2009). Inadequacies identified in abstracts led subsequently to the development of the PRISMA for Abstracts checklist (Beller *et al.* 2013). The PRISMA for Abstracts checklist provides a comprehensive guide for reporting abstracts to ensure they provide accurate and explicit summaries of systematic reviews and meta-analyses to allow selection and retrieval of the full text by interested readers. The PRISMA for Abstracts checklist contains 12 items - title, objective, eligibility criteria, information source, risk of bias, included studies, synthesis of results, description of effect, strength and limitations, interpretations, funding and registration (Beller *et al.* 2013).

Recently there have been efforts made to improve the quality, content and structure of abstracts for systematic reviews in Endodontology with the *International Endodontic Journal* introducing requirements for structured abstracts and PROSPERO registration for systematic reviews in 2018 and the *Journal of Endodontics* also requesting a structured abstract. It is acknowledged within Endodontology that there is further need for improved reporting of systematic reviews in order to generate more consistent content and findings

that are easier to digest (Duncan *et al*. 2016). As a result, the objectives of this article are to explain the requirements for reporting abstracts of systematic reviews and to describe and emphasise the importance of each item in the PRISMA for Abstracts checklist as it relates to Endodontology. The article is based on the PRISMA for Abstracts explanation and elaboration document for reporting abstracts of systematic reviews (Beller *et al.* 2013) and provides explanations and examples related to Endodontology for each item in the PRISMA for Abstracts checklist to guide authors on writing abstracts for systematic reviews.

Explanation and endodontic examples of items in the PRISMA for Abstracts checklist

In this section, each item of the PRISMA for Abstracts checklist is explained and accompanied by endodontic examples from peer-reviewed journals.

Item 1: Title: Identify the report as a systematic review, meta-analysis, or both

Explanation

The abstract and title of the review should include information that the report is a systematic review, meta-analysis, or both (examples 1a and 1b). It is also good practice to mention whether other statistical tools were used, e.g. trial sequential analysis (example 1c) and network meta-analysis (example 1d). This is important for indexing and searching using key words. This will supplement search filters incorporated to identify such reviews (Montori *et al*. 2005, Beller *et al*. 2013). Mention of study design in the title will help readers to identify the type of study being described, for example, randomised clinical trial, observational study, animal study or laboratory study, e.g. examples 1e and 1f included the terms *in vitro* and randomized controlled trials respectively.

The titles should include information based on the PICOS format (participants, interventions, comparators, outcomes, and study designs) to help readers understand the scope and extent of the review. In some cases, the title may become too long (as certain journals impose a word or character limit) and in that situation only the key features of the PICOS, which make the review unique and important, need be incorporated. In Example 1f:

P – irreversible pulpitis treatment, I – articaine, C- Lidocaine, O- Efficacy and safety, S - randomized controlled trials.

Examples

Example 1a: "The prevalence of postoperative pain and flare-up in single- and multiple-visit endodontic treatment: a systematic review" (Sathorn *et al*. 2008).

Example 1b: "Effectiveness of technology-enhanced learning in Endodontic education: a systematic review and meta-analysis" (Nagendrababu *et al*. 2019a).

Example 1c: "Single-visit or multiple-visit root canal treatment: systematic review, meta-analysis and trial sequential analysis" (Schwendicke & Göstemeyer 2017).

Example 1d: "Effect of oral premedication on the anaesthetic efficacy of inferior alveolar nerve block in patients with irreversible pulpitis - A systematic review and network meta-analysis of randomized controlled trials" (Nagendrababu *et al*. 2019b).

Example 1e: "Ultrasonically Activated Irrigation to Remove Calcium Hydroxide from Apical Third of Human Root Canal System: A Systematic Review of In Vitro Studies" (Yaylali *et al*. 2015).

Example 1f: "Efficacy and safety of articaine versus lidocaine for irreversible pulpitis treatment: A systematic review and meta-analysis of randomised controlled trials" (Su *et al*. 2016).

Item 2: Objectives: the research question including components such as participants, interventions, comparators, and outcomes

Explanation

The objectives stated in the abstract should allow readers to understand the research question(s) that is being addressed and the overall aim of the review. The objective should be in line with the results reported as well as be reflective of the evaluation on the benefits

(example 2a), harms (example 2b), association (example 2c), predictive value, of the intervention or exposure of interest and the population or context being studied (Beller *et al*. 2013).

Examples

Example 2a: "The purpose of this systematic review and meta-analysis was to examine the literature and quantify the survival of IR teeth and compare it with that of ISCs" (intentionally replanted (IR), implant-supported single crowns (ISCs)) (Torabinejad *et al*. 2015)

Example 2b: "This study comprises a systematic review, designed to address the question of whether the risk of endodontic complications is greater with composite resin restorations than with other restorative materials, such as amalgam" (Dawson *et al*. 2015).

Example 2c: "The aim of this systematic review and meta-analysis was to analyze scientific available evidence on the association between diabetes and the presence of radiolucent periapical lesions (RPLs) in root-filled teeth (RFT)" (Segura-Egea *et al*. 2016).

Item 3: Eligibility criteria: study and report characteristics used as criteria for inclusion

Explanation

Specific criteria relating to the inclusion and exclusion of studies in a systematic review are a major advantage compared with a narrative review. A clear understanding of the eligibility criteria for selection of studies enables the reader to form an assessment on the applicability of the findings. Study characteristics mainly include the eligibility criteria that are based on the PICOS framework, that is on the type of population (diagnosis/clinical condition), primary intervention and the comparator being evaluated, primary and secondary outcomes assessed and the type of study design specified (examples 3a, 3b). Report characteristics mainly include the language of publication (mention languages included (example 3c) or no language restriction (example 3d)), year (examples 3c, 3d), type of publication (published/

unpublished) (example 3e). The above characteristics should be included in the eligibility criteria as this will affect the effect estimates and associations in a meta-analysis.

Examples

Example 3a: "Randomized controlled trials evaluating the efficacy of oral premedications, whether given alone or in combination, compared with other agents, placebo, or no treatment in adult patients before NSRCT for postoperative pain were included. Nonintervention studies, nonendodontic studies, animal studies, and reviews were excluded" (NSRCT – Nonsurgical root canal treatment) (Nagendrababu *et al*. 2019b).

Example 3b: "Clinical studies published until 1st June 2018 which utilised orthograde techniques to sample and analyse PTF were included. Cell culture, laboratory or animal studies and those concerned with investigating inflammatory mediator activity from within healthy or diseased pulp tissue, and not periradicular tissues, were excluded" (Virdee *et al*. 2019)

Example 3c: "Three electronic databases (Medline, Embase, and PubMed) were searched to identify human studies from 1966 to October 2009 in 5 different languages (English, French, German, Italian, and Spanish)" (Setzer *et al*. 2012).

Example 3d: "A literature search was performed in the MEDLINE and EBSCOhost databases until June 2017 with no language restriction" (Nagendrababu *et al*. 2019b).

Example 3e: "We retrieved published randomized clinical trials (RCTs) of at least 6-month duration……" (Shirvani *et al*. 2014).

Item 4: Information sources: key databases searched and search dates

Explanation

Details of each database used in the search and the date range /last date searched (examples 4a, 4b, 4c) must be reported in the abstract. If three or fewer databases were searched, all

should be listed (example 4d). If more than three databases are used for the searches, then the three which yielded the majority of the selected studies should be enumerated.

Examples

Example 4a: "The literature search included all publications without a year limit. The last search was performed on January 31, 2018. An electronic search was performed using MEDLINE (PubMed), Cochrane, and Scopus" (Metlerska *et al*. 2019)

Example 4b: "A literature search was performed in the MEDLINE and EBSCOhost databases until June 2017 with no language restriction" (Nagendrababu *et al*. 2019b).

Example 4c: "Cochrane Oral Health's Trials Register (to 13 September 2016); the Cochrane Central Register of Controlled Trials (CENTRAL; 2016, Issue 8) in the Cochrane Library (searched 13 September 2016); MEDLINE Ovid (1946 to 13 September 2016); Embase Ovid (1980 to 13 September 2016); LILACS BIREME Virtual Health Library (1982 to 13 September 2016); and OpenSIGLE (1980 to 2005). ClinicalTrials.gov and the World Health Organization International Clinical Trials Registry Platform were searched for ongoing trials. We also searched Chinese BioMedical Literature Database (in Chinese, 1978 to 20 September 2016" (Ma *et al.* 2016)

Example 4d: "Ovid MEDLINE (1946-December 15, 2015), the Cochrane Database of Systematic Reviews (2005-December 15, 2015), and the Cochrane Central Register of Controlled Trials (to December 15, 2015) were searched using included drugs, indications, and study designs as search terms" (Smith *et al.* 2017)

Item 5: Risk of bias: methods for assessing risk of bias

Explanation

The validity of a systematic review can be questioned due to flaws in the design and methodological conduct of the included studies and it is important to understand these deficiencies during the interpretation of the results. For example, inadequate allocation

sequence concealment can lead to spurious treatment effects in randomized clinical trials. Biased effect estimates could also occur when blinding of the outcome examiners was inadequate or not carried out. Assessment of the validity of the studies will give an estimate of the risk of overestimation of the effect observed. The methods used to assess the validity of studies including the risk of bias should be explained in the abstract (Beller *et al*. 2013) (examples 5a, 5b).

Examples

Example 5a: ‘‘The risk of bias was assessed using Cochrane criteria” (Neelakantan *et al*. 2018).

Example 5b: “Quality of the included studies was appraised by the revised Cochrane risk of bias tool for randomized trials” (Pulikkotil *et al*. 2018)

Item 6: Included studies: number and type of included studies and participants, and relevant characteristics of studies

Explanation

The accuracy, robustness, validity and applicability of the results of a systematic review can be assessed by the information on the number (example 6a) and type (examples 6b, 6c) of studies included, characteristics of the participants and the studies. The characteristics of the participants (e.g. age, severity of disease), interventions and comparison (e.g. dose and frequency of drug administration) (examples 6d, 6e), and outcomes (e.g. follow-up times) (example 6f) should be included in the abstract. If various study designs were involved in the systematic review, they should be mentioned separately (example 6b).

Examples

Example 6a: “We included 11 trials involving 851 participants with 879 teeth which had undergone root canal treatment and involved the use of irrigants” (Fedorowicz *et al*. 2012).

Example 6b: “Seven studies (five in vitro and two in vivo) fulfilled the inclusion criteria for this review” (AlRahabi & Ghabbani 2019).

Example 6c: “The search resulted in 426 titles from all databases, and 26 studies met the inclusion criteria. Five were randomized trials, and the others were case reports” (Metlerska *et al*. 2019).

Example 6d: “We included six studies (916 participants with 988 teeth) reported in English. All the studies had high risk of bias. The six studies examined five different comparisons, including MTA versus intermediate restorative material (IRM), MTA versus super ethoxybenzoic acid cement (Super-EBA), Super-EBA versus IRM, dentine-bonded resin composite versus glass ionomer cement and glass ionomer cement versus amalgam” (Ma *et al*. 2016).

Example 6e: “Initially, 109 possibly relevant articles were identified. After screening and full-text evaluations, 28 articles that met the inclusion criteria were analyzed, reporting on a total of 84 patients with altered sensation after extrusion of root canal filling materials” (Rosen *et al*. 2016)

Example 6f: “For pulpotomy, we assessed three comparisons as providing moderate-quality evidence. Compared with formocresol, MTA reduced both clinical and radiological failures, with a statistically significant difference at 12 months for clinical failure and at six, 12 and 24 months for radiological failure (12 trials, 740 participants). Compared with calcium hydroxide, MTA reduced both clinical and radiological failures, with statistically significant differences for clinical failure at 12 and 24 months” (Smaïl-Faugeron *et al*. 2018).

Item 7: Synthesis of results: results for main outcomes (benefits and harms), preferably indicating the number of studies and participants for each. If a meta-analysis was done, include summary measures and confidence intervals

Explanation

The number of studies and participants included in systematic reviews should be mentioned (example 7a). Summary measures (effect) and confidence intervals for all outcomes from a meta-analysis should be provided. Each outcome measure should also include the number of studies (example 7a) and number of participants (example 7a), particularly in situations where only a small subset of the total number of studies was included for the meta-analysis. All outcomes as published in the protocol should be described in the abstract and not just the statistically or clinically significant ones (example 7b). The secondary outcomes should also be reported (example 7c). In the event of unavailability of summary measures, a numerical descriptive can be given for the studies with a positive, negative or non-directional outcome but it must be highlighted that these are just numbers and not weighted measures. Where the intention to perform a meta-analysis was indicated in the protocol, but was not performed, the reasons should be described for each outcome (example 7d).

Examples

Example 7a: "Three hundred titles were identified, and three studies achieved the inclusion criteria. Data from 54 936 root canal treatments, 50 301 in nondiabetic control subjects and 4635 in diabetic patients, were analysed. The calculated overall odds ratio (OR = 2.44; 95% CI = 1.54-3.88; P = 0.0001) implies that diabetics had a significantly higher prevalence of extracted RFT than healthy nondiabetic subjects" (Cabanillas-Balsera *et al*. 2019).

Example 7b: "Subgroup analyses showed a similar beneficial effect for ibuprofen, diclofenac, and ketorolac (RR = 1.83 [95% CI, 1.43-2.35], RR = 2.56 [95% CI, 1.46-4.50], and RR = 2.07 [95% CI, 1.47-2.90], respectively). Dose-dependent ibuprofen >400 mg/d (RR = 1.85; 95% CI, 1.39-2.45) was shown to be effective; however, ibuprofen ≤400 mg/d showed no association (RR = 1.78; 95% CI, 0.90-3.55)" (Nagendrababu *et al*. 2018).

Example 7c: "One study recorded the incidence of postoperative endodontic flare-ups (people who returned with symptoms that necessitated further treatment). Adverse effects, as reported in one study, were diarrhoea (one participant, placebo group) and fatigue and reduced energy postoperatively (one participant, antibiotic group)" (Cope *et al*. 2018).

Example 7d: “Of these, 24 met the inclusion criteria and were included in the systematic review. A considerable heterogeneity was found in the methodologies of included studies. Therefore, it was not feasible to perform meta-analysis” (AlShwaimi *et al*. 2016).

Item 8: Description of effect - direction of the effect (i.e. which group is favoured) and size of the effect in terms meaningful to patients and clinicians

Explanation

The abstract should describe the primary outcomes as text and numbers. The direction of the effect summary whether it is positive, negative or non-directional as well as the size in common terms such as days, percentages etc. should be described. This helps the understanding of readers not familiar with statistical terms such as effect estimate and confidence intervals. The baseline values should be given for the readers to estimate the absolute difference of the effect in the follow-up analysis. The abstract should indicate whether the reported measures are absolute or relative (percentage measures) (examples 8a, 8b) and should also report continuous measures in familiar units.

Examples

Example 8a: “single-visit root canal treatment appeared to be slightly more effective than multiple visit, i.e. 6.3% higher healing rate” (Sathorn *et al*. 2005).

Example 8b: “More participants in the surgically treated group reported pain in the first week after treatment (RR 3.34, 95% CI 2.05 to 5.43; one RCT, 87 participants; low quality evidence)” (Del Fabbro *et al*. 2016).

Item 9: Strengths and limitations of evidence: brief summary of strength and limitations of evidence (e.g. inconsistency, imprecision, indirectness, or risk of bias, other supporting or conflicting evidence).

Explanation

The strengths and limitations of the evidence within selected studies should be described. Risk of bias (example 9a) is a potential limitation that can occur and could be related to: absence of blinding, absence of data (e.g. dropouts), heterogeneity in the outcome size and direction, lack of reliability due to small number of participants (examples 9b, 9c), absence of direct evidence (example 9d), patient selection bias (example 9e), and attempts to limit publication bias. Such limitations must be described in the abstract. Strengths can include the effect size when large, consistency in the direction of effect among studies, presence of a dose-response effect and the inclusion of high-quality studies (example 9f).

Examples

Example 9a: "On the basis of available evidence, the use of root canal sealer increases the fracture resistance of endodontically treated teeth. However, included studies presented considerable risk of bias. Regarding the comparisons among the sealers, no conclusions could be drawn for the superiority of one sealer type to another" (Uzunoglu-Özyürek *et al.* 2018)

Example 9b: "This systematic review which was based on one low powered small sample trial assessed as at low risk of bias, illustrates that there is insufficient evidence to determine whether antibiotics reduce pain or not compared to not having antibiotics. The results of this review confirm the necessity for further larger sample and methodologically sound trials that can provide additional evidence as to whether antibiotics, prescribed in the preoperative phase, can affect treatment outcomes for irreversible pulpitis" (Agnihotry *et al*. 2016)

Example 9c: "Overall the methodological quality of studies has improved since the previous systematic review was published in 2006. The conclusions are that there is limited scientific evidence that application of calcium hydroxide or mineral trioxide aggregate to an exposed pulp frequently results in formation of a hard tissue barrier, whereas adhesives or enamel matrix derivatives do not" (Fransson *et al.* 2016).

Example 9d: “The existing literature lacks high-quality studies with a direct comparison of outcomes of MAP and RE” (mineral trioxide aggregate (MTA) apical plug (MAP) and regenerative endodontic treatment (RET)) (Torabinejad *et al.* 2017)”.

Example 9e: “Two studies provided data for the comparison between systemic antibiotics (penicillin VK) and a matched placebo for adults with acute apical abscess or a symptomatic necrotic tooth when provided in conjunction with a surgical intervention. Participants in one study all underwent a total pulpectomy of the affected tooth, while participants in the other study had their tooth treated by either partial or total pulpectomy” (Cope *et al*. 2018).

Example 9f: “In a follow-up of 1 year postoperatively, a successful outcome was achieved in 89.0% of patients” (Tsesis *et al.* 2013).

Item 10: Interpretation: general interpretation of the results and important implications

Explanation

The main summary of the results including the direction of the effect estimate(s) should be described for the benefit of readers not familiar with statistical terms and language (examples 10a, 10b). This description should include what is clear, what has uncertainties or ambiguities, the availability or need of new studies that could address the uncertainties (example 10c). Unavailability of good quality studies to address the review questions should be reported as necessary (example 10c). In the event of a non-significant result, an interpretation of the confidence interval (CI) should be provided (examples 10d, 10e). A narrow confidence interval indicates that a difference between interventions is unlikely while a wide CI indicates that there is a possibility of detecting a difference if confounding factors are addressed. If the overall conclusion is different from those of preceding reviews using similar questions, an explanation for the variation must be given. Implications of the review to policy and practice should be provided.

Examples

Example 10a: "…. nonsurgical repair of root perforation results in a success rate of more than 70%. Teeth in the maxillary arch and absence of preoperative radiolucency adjacent to the perforation are favourable preoperative factors for healing after perforation repair. In view of the relatively high rate of clinical success, nonsurgical repair may be considered as the preferred treatment to handle this complication that arises during root canal therapy" (Siew *et al*. 2015).

Example 10b: "MTA has a higher success rate and results in less pulpal inflammatory response and more predictable hard dentin bridge formation than CH. MTA appears to be a suitable replacement of CH used for direct pulp capping" (Li *et al*. 2015).

Example 10c: "The results of this study did not show significant differences for root fracture incidence between metal- and fiber posts. However, the studies included in this review presented a high risk of bias, and further well-designed clinical studies are required to confirm these findings" (Figueiredo *et al*. 2015).

Example 10d: "Maxillary infiltration subgroup analysis showed no significant difference between articaine and lidocaine (OR, 3.99; 95% CI, 0.50-31.62; P = .19; I(2) = 59%)" (Kung *et al*. 2015).

Example 10e: "There was no evidence that using CBCT rather than radiography for preoperative evaluation was advantageous for healing (RR 1.02, 95% CI 0.70 to 1.47; one RCT, 39 participants; very low quality evidence), nor that any magnification device affected healing more than any other (loupes versus endoscope at one year: RR 1.05, 95% CI 0.92 to 1.20; microscope versus endoscope at two years: RR 1.01, 95% CI 0.89 to 1.15; one RCT, 70 participants, low quality evidence)" (Del Fabbro *et al*. 2016)

Item 11: Funding: primary source of funding for the review

Explanation

Sources of funding (from the authors of the systematic review or the included trials) should be reported in the abstract of the review as the readers can then appreciate and understand the effect of any conflict of interest on the results. Pharmaceutical company funding of

clinical trials and reviews has been reported to have a relationship with the results of studies that generally favour the product of the company (Sung *et al*. 2013, Amiri *et al.* 2014). An association between sponsorship and research outcome has also been demonstrated (Lundh *et al.* 2017). Hence, it is necessary to report the source of funding in the abstract. Interestingly, most systematic reviews and meta-analyses in Endodontology are silent on funding. Some journals (e.g. the Lancet) have a separate funding section as a requirement in their abstracts for systematic reviews (example 11a-c), while others declare funding on the cover page of the article but do not include it in the Medline abstract (e.g. PlosOne – example 11d).

Examples

Example 11a: "Funding: Bill & Melinda Gates Foundation "(Portnoy *et al*. 2019)

Example 11b. "Funding: Roche Pharma AG "(Saad *et al*. 2019)

Example 11c: "Funding: None." (Noubiap *et al*. 2019)

Example11d: "This study was made possible with a grant from the Arnold P. Gold Foundation (www.humanism-in-medicine.org; grant #FI-11-004). Joe Kossowsky's contributions to this study were supported by the Swiss National Science Foundation, grant project (P2BSP1_148628). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript" (Kelley et al. 2014)

Item 12: Registration: registration number and registry name.

Explanation

The *a priori* registration of a review protocol is necessary to provide a record of what reviews have been initiated and completed. The registration details including the specific database and the registration number should be given in the abstract. Registration of systematic reviews creates an audit trail and will inform other reviewers about the ongoing work as well as identify reviews which were not completed and thus provide indirect, circumstantial evidence of publication bias. Non-significant results or rejection by multiple journals can lead to completed reviews remaining unpublished with the result that reporting bias occurs. In general, studies with positive results have a greater chance of being accepted for

publication. Published reviews should report the same methods and outcomes as stated in the registered protocol (examples 12a, 12b).

It should be noted that many registration databases will only accept prospective registrations and will refuse applications if data collection has been completed (e.g. PROSPERO).

Examples

Example 12a**:** **"**The systematic review was registered in PROSPERO (CRD 42017077043)" (Tavares *et al.* 2019)
Example 12b: This study was registered in the PROSPERO database (CRD42017058704), and Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement recommendations were followed" (Nogueira *et al*. 2018).

Discussion

Systematic reviews and meta-analyses are ranked first in the evidence-based medicine pyramid (Murad *et al.* 2016). Although it should be accepted that systematic reviews can only be as good as the quality of the studies they include, the reviews should be reported using the highest standards as clinicians and patients rely on them to update their knowledge. Abstracts of systematic reviews play an important role in clinical decision making because most clinicians and patients have access only to abstracts. The information in the abstracts of systematic reviews is integral to healthcare decision-making in day-to-day clinical practice (Kiriakou *et al.* 2013); the abstracts should be valid, accurate, complete and transparent in the context of information covering the management and effectiveness of interventions. Therefore, the reporting quality of abstracts of systematic review should mirror the high standards of reporting in the full manuscript (Faggion *et al.* 2014). The current article was prepared to explain the individual items within the PRISMA for Abstracts checklist and provide helpful examples for the authors of systemic reviews in order to improve the quality of abstracts in Endodontology.

Many journals have their own format (headings, subheadings) for writing structured abstracts. For example: the *International Endodontic Journal* uses the following headings:

Background, Aim, Data sources, Study eligibility criteria, Participants and Interventions, Study appraisal and Synthesis methods, Results, Limitations and Conclusions and Implications of key findings, whereas the *Journal of Endodontics* uses: Introduction, Methods, Results and Conclusions. The PRISMA for Abstracts checklist does not suggest that journals should change their abstract format, but does recommend the necessary details are reported under the main headings used by the journal. The order of items and the headings are flexible and can be arranged by the authors. For example, "protocol registration" is the last item in the checklist; however, the relevant details can also be included in the Methods section; "strengths and limitations" can be provided at the end of the Results, Discussion or Conclusion sections.

The creation of a high-quality abstract should not rely exclusively on a checklist and other factors must be considered. For example, selectively reporting only favourable results that are statistically significant while not describing others is not a truthful reflection of the full review and will lead readers to make conclusions on only limited information. A good abstract should report all results from an analysis as published in the *'a priori'* protocol and not only a collection of favourable results that suit the authors or funders. This will ensure that the abstract is a true and unbiased representation of the full review. Editors and reviewers along with the authors have a responsibility to ensure the accuracy and completeness of an abstract and its alignment to the full text of the review.

Editors are encouraged to ensure that abstracts associated with systematic reviews are of the highest quality and adhere to the PRISMA for Abstracts guidelines and should ensure that their ''Instructions or Guide to Authors and Reviewers'' contains reference to them.

Conclusion

This article serves as a ''user's manual'' to accompany the PRISMA for Abstracts checklist to provide guidance for the authors and journals in the writing and critical appraisal of abstracts that accompany systematic reviews in Endodontology.

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