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Reporting guidelines enhance the quality and impact of research in *Dental Traumatology*.

ABSTRACT

Reporting guidelines assist basic scientists, translational healthcare researchers and clinicians to publish manuscripts of the highest standard by improving the accuracy, transparency, and completeness of the publications they submit to journals. This paper provides an overview of reporting guidelines relevant for the specialty of dental traumatology and discusses their application, significance, and potential impact. The Preferred Reporting Items for study Designs in Endodontology (PRIDE) suite of reporting guidelines includes a range of study designs that can be used within the broad field of Endodontics but they are also applicable to dental traumatology and other dental disciplines (Preferred Reporting Items for Case reports in Endodontics [PRICE] 2020, Preferred Reporting Items for RAndomized Trials in Endodontics [PRIRATE] 2020; Preferred Reporting Items for Animal Studies in Endodontology [PRIASE] 2021; Preferred Reporting Items for Laboratory studies in Endodontology [PRILE] 2021, Preferred Reporting items for OBServational studies in Endodontics [PROBE] 2023). The PRIDE guidelines were developed by an extensive network of globally-renowned academics, researchers and expert clinicians working within dentistry using an accepted and validated consensus methodology. The aim of the PRIDE guidelines is to improve the overall quality of manuscripts describing case reports, randomized trials, animal research, laboratory studies and observational studies. Although, attention to reporting guidelines adds a degree of complexity when writing reports, such guidelines provide a template for authors to develop standardised manuscripts of the highest quality, which will allow colleagues, readers and the wider public to have confidence that their findings are valid and robust. They also provide evidence to editors that manuscripts submitted

to journals comply with the highest global standards of reporting within their respective discipline. Endorsement of the PRIDE guidelines by editors will lead to improvements in the reporting quality of manuscripts submitted to their journals.

Keywords: Dental traumatology, reporting guidelines, research

1. INTRODUCTION

The research process culminates in scholarly publications, as this is the stage that enables the findings of an experiment, clinical investigation or literature review to be communicated to readers, clearly, reproducibly and without ambiguity. The work that is being reported must be carried out in an ethical and responsible manner, and must also comply with all relevant local, national, and international legislation¹. However, there is an overwhelming body of evidence indicating that the current quality of the reporting of biomedical research is suboptimal^{2,3,4}. It is also well-known that a substantial number of manuscripts are rejected by journals and subsequently never published due to significant flaws in methodological reporting. Rejections of this type are wasteful for academic and clinical institutions, and they are also a source of frustration for authors and the busy editorial and review teams who spend time critically appraising manuscripts that have a low chance of being published.

2. WHAT IS THE AIM OF THE CURRENT MANUSCRIPT?

The aim of the current manuscript is to provide an overview of a range of reporting guidelines that can be applied to the specialty of dental traumatology, and which have been endorsed by *Dental Traumatology*.

3. WHAT ARE REPORTING GUIDELINES?

Reporting guidelines consist of a simple checklist, flowchart, or structured text developed using clear and robust methodology⁵ that are used to aid researchers and clinicians within the healthcare sector when they develop reports for publication. In simple terms, reporting guidelines are a tool that should be used by authors when preparing manuscripts to ensure completeness of their submissions. As an example, the

Consolidated Standards of Reporting Trials (CONSORT; <https://www.consort-statement.org>) and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; <https://prisma-statement.org>) are the most popular reporting guidelines used by authors when reporting randomised trials and systematic reviews, respectively. It is worth noting that some of these guidelines also have extensions for specific medical specialties, for example, the CONSORT extension for herbal medicines⁶ and the PRISMA extension for acupuncture⁷. These guidelines are not specific to dentistry but are nevertheless endorsed by several high impact journals in the dental field.

4. NEED FOR REPORTING GUIDELINES

In healthcare research and clinical practice, the publication of reports with unclear, incomplete, or misleading information is likely to mask how well the research or clinical investigation may have been conducted and what was discovered, preventing critical evaluation and future application of the findings. Additionally, it is waste of the monetary and human resources invested in the work². If research and clinical methodologies, results and conclusions are poorly described, it is impossible for readers to evaluate the validity of the methodology employed and hence the reliability of the findings. Moreover, it may be difficult or impossible for others to reproduce the work⁸ or to compare the work quantitatively with other publications by meta-analysis.

To address the potential of reporting deficiencies appearing in manuscripts, reporting guidelines can help authors by improving the transparency, accuracy, clarity, and completeness of their publications so as to enhance the value of their published studies. They can also help editors and reviewers verify that submitted manuscripts are of high-quality, accurate, reproducible, clear, transparent, unbiased, ethical and safe in

the context that the subsequent editorial process will be systematic and will eventually assist appropriate decision making in day-to-day clinical practice. Finally, it must also be recognized that stakeholders with leadership roles at a national level, such as national dental officers, guideline developers and users, policy makers, as well as patients rely on the literature to understand the evidence and make decisions^{9,10,11,12}.

5. DENTAL TRAUMATOLOGY

Dental Traumatology is the official journal of the International Association for Dental Traumatology and the International Academy of Sports Dentistry and covers topics related to dental trauma (<https://onlinelibrary.wiley.com/page/journal/16009657/homepage/productinformation.html>). In 2021, the journal's impact factor was 3.328 and it was ranked 31 out of 92 journals in the category of Dentistry, Oral Surgery & Medicine¹³.

6. DENTAL TRAUMATOLOGY ENDORSED PREFERRED REPORTING ITEMS FOR STUDY DESIGNS IN ENDODONTOLOGY (PRIDE)

The number of publications submitted to *Dental Traumatology* has increased over the last few years, from 272 in 2018 to 481 in 2020 (Paul Abbott; Unpublished data). Unfortunately, a significant number of manuscripts (average approximately 75% of submissions each year) are rejected due to inadequate methodology and poor reporting quality (Paul Abbott; Unpublished data). Consequently, it is essential for authors to follow the appropriate reporting guideline before submitting an article for publication. In this way, authors can check the quality of reporting prior to submitting an article to a journal which enables them to identify flaws in their submissions prior to the peer review process¹². To assist authors, the Editorial Board of *Dental Traumatology* has endorsed the

PRIDE reporting guidelines for various study designs. The primary objective of this policy is not to overwhelm researchers, but rather to reduce bias and promote the overall quality and integrity of manuscripts submitted to the journal.

7. THE Preferred Reporting Items for study Designs in Endodontology (PRIDE) NETWORK

The PRIDE network is a web-based resource (<https://pride-endodonticguidelines.org>) that has been developed to raise awareness of the significance of adhering to high standards when producing publications in the field of Endodontology. The PRIDE team has compiled a comprehensive set of reporting guidelines for the specialty of Endodontology for various study designs, which can also be viewed on the Wiley Online Library [site](https://onlinelibrary.wiley.com/page/journal/13652591/homepage/pride-guidelines.htm) - <https://onlinelibrary.wiley.com/page/journal/13652591/homepage/pride-guidelines.htm>. The reporting guidelines published by the PRIDE network have been developed based on the Guidance for Developers of Health Research Reporting Guidelines⁵. The materials (checklist and flowchart) related to each guideline can be freely downloaded from the PRIDE website (<https://pride-endodonticguidelines.org>).

Five reporting guidelines have been published:

- Case reports: Preferred Reporting Items for Case reports in Endodontics (PRICE)¹⁴;
- Randomized trials: Preferred Reporting Items for RAndomized Trials in Endodontics (PRIRATE)¹⁵;
- Animal studies: Preferred Reporting Items for Animal Studies in Endodontology (PRIASE)¹⁶;

- Laboratory studies: Preferred Reporting Items for Laboratory studies in Endodontology (PRILE)¹⁷;
- Observational studies: Preferred Reporting items for OBservational studies in Endodontics (PROBE)¹⁸;

One further reporting guideline is in preparation:

- Diagnostic accuracy studies: Preferred Reporting Items for Diagnostic Accuracy Studies in Endodontics (PRIDASE)¹⁹.

8. OVERVIEW OF PRIDE NETWORK PROJECTS

8.1. Case reports: Preferred Reporting Items for Case reports in Endodontics (PRICE) 2020

The initial draft of the case report checklist was created by a steering group who integrated and adapted the CAse REport (CARE) guidelines²⁰ and the Clinical and Laboratory Images in Publications (CLIP) principles²¹. The steering committee then created a PRICE Delphi Group of 30 individuals to participate in an online Delphi survey to achieve consensus on the items within the checklist. On September 13, 2019, a PRICE Face-to-Face Consensus Meeting was held at the 19th Biennial Congress of the European Society of Endodontology (ESE) in Vienna, Austria, which was attended by two steering committee members, 21 individuals and two postgraduate students from around the world. After the meeting, the steering group piloted the guidelines and then published the checklist of 47 items and a flowchart¹⁴.

8.2. *Randomized trials: Preferred Reporting Items for RAnomized Trials in Endodontics (PRIRATE) 2020*

The initial draft of the clinical trial checklist was developed by a steering committee who combined and modified the Consolidated Standards of Reporting Trials (CONSORT) guidelines²² and the CLIP principles²¹. The steering committee then formed a PRIRATE Delphi Group of thirty individuals to take part in the online Delphi survey. On September 13, 2019, the PRICE Face-to-Face Consensus Meeting took place at the 19th ESE Biennial Congress in Vienna, Austria. The meeting was attended by four members of the steering committee and 21 others from around the world. After the meeting, the steering committee released the final version of the 58-item checklist and a flowchart¹⁵.

8.3. *Animal studies: Preferred Reporting Items for Animal Studies in Endodontology (PRIASE) 2021*

A steering committee integrated and adapted the Animal Research: Reporting of In Vivo Experiments (ARRIVE) statements^{23,24} and CLIP principles²¹ to create an initial draft of the checklist. The steering committee then formed a PRIASE Delphi group consisting of 31 individuals to achieve consensus on the draft checklist. On September 9, 2020, seven steering committee members, 19 other individuals, and two postgraduate students participated in an online meeting. After the meeting, the steering committee released the final version of the 43-item checklist and a flowchart¹⁶.

8.4. *Laboratory studies: Preferred Reporting Items for Laboratory studies in Endodontology (PRILE)*

The modified CONSORT checklist of items for reporting *in vitro* investigations of dental materials²⁵ and the CLIP principles²¹ were adapted by a steering group to create the first draft of the PRILE checklist. The steering committee then formed a Delphi Group of 30 individuals to achieve the necessary consensus. Three steering committee members, 24 other individuals, and two postgraduate students from different parts of the world participated in an online meeting on February 12, 2021. Following the meeting, the steering group released the final 40-item checklist and flowchart¹⁷.

8.5. *Observational studies: Preferred Reporting items for OBservational studies in Endodontics (PROBE) 2023*

The first draft of the PROBE checklist was formed by a steering committee who combined and adapted the STrengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist²⁶ and the CLIP principles²¹. The steering committee then formed a group of 30 individuals to take part in the online Delphi survey in order to achieve consensus. On October 7, 2022, an online meeting was held using the Zoom platform. This was attended by four steering committee members, 21 other individuals, and two postgraduate students. Following the meeting, the steering committee published the final version of the 58-item checklist¹⁸.

8.6. *Diagnostic accuracy studies: Preferred Reporting Items for Diagnostic Accuracy Studies in Endodontics (PRIDASE).*

The protocol of the process involved in developing the PRIDASE guidelines has been published¹⁹. The steering group is in the process of developing an initial draft checklist

by adapting and modifying the Standards for Reporting of Diagnostic Accuracy Studies (STARD) 2015 guidelines²⁷ and the CLIP principles²¹.

9. ENHANCING THE QUALITY AND TRANSPARENCY OF HEALTH RESEARCH (EQUATOR) NETWORK

The EQUATOR Network is an initiative that supports the use of reporting guidelines in health research. It provides a complete collection of reporting guidelines and other resources to encourage improvements in reporting within a wide range of disciplines. In addition to its database of reporting guidelines, the EQUATOR network provides researchers with additional resources, including materials and training to assist them in writing comprehensive and transparent scientific manuscripts (<http://www.equator-network.org/>). Recently, the PRICE 2020 (<https://www.equator-network.org/reporting-guidelines/price-2020-guidelines-for-reporting-case-reports-in-endodontics-a-consensus-based-development/>), PRIRATE 2020 (<https://www.equator-network.org/reporting-guidelines/prirate-2020-guidelines-for-reporting-randomized-trials-in-endodontics-a-consensus-based-development/>) and PRIASE 2021 (<https://www.equator-network.org/reporting-guidelines/priase-2021-guidelines-for-reporting-animal-studies-in-endodontology-a-consensus-based-development/>) guidelines have been included in the EQUATOR Network with the expectation that the other PRIDE guidelines will be included in due course. The materials (checklist and flowchart) related to PRICE 2020, PRIRATE 2020 and PRIASE 2021 guidelines can also be downloaded from the EQUATOR Network website.

10. CRITICAL APPRAISAL OF CASE REPORTS AND RANDOMISED TRIALS

Several papers have described flaws and deficiencies in the reporting quality of case reports and randomised trials in the field of dentistry, which emphasizes the need for authors to improve the standard of their manuscripts prior to submission. For example, Seguel-Moraga et al. appraised the reporting quality of case reports within the discipline of dental traumatology using the CARE guidelines²⁸. They reported that the CARE items with the highest percentage of compliance were the reporting of “clinical findings” and “introduction”, whereas the items with the least compliance were “patient perspective”, “timeline” and “informed consent”. In summary, they concluded that the reporting quality of case reports within dental traumatology had not improved since the publication of the CARE guidelines²⁸. Berlin-Broner and Levin appraised the quality of case reports relating to Endodontics using the PRICE 2020 guidelines and identified several areas that were frequently not described²⁹. They concluded that authors should adhere to the PRICE 2020 guidelines in order to raise the overall quality of their case reports prior to submission²⁹.

With respect to clinical trials, Al-Namankany et al., assessed the reporting quality of randomised controlled trials in paediatric dental publications between 1985 and 2006³⁰ and concluded it was poor. Similarly, a separate report by Rajasekharan et al., on the reporting quality of randomised trials in paediatric dental journals published in 2011 and 2012 concluded it was inadequate³¹. Subsequently, Alnamankany and Ashley (2020) evaluated the reporting quality of randomised clinical trials published in paediatric dentistry across two distinct time intervals (2014–2015 and 1985–2006) and highlighted that the overall quality of all article sections had improved³². It has also been reported that the quality of randomised controlled trials in oral maxillofacial surgery has also progressed over time, a fact attributed to adherence to the CONSORT guidelines³³. Indeed,

numerous studies in medicine have examined adherence to the CONSORT guidelines and reported that their implementation had led to improved trial reporting quality^{34,35,36,37}.

Finally, Nagendrababu et al., assessed the reporting quality of randomised trials published in Endodontics using the PRIRATE 2020 guidelines and reported a number of deficiencies. They concluded that for the benefit of both clinicians and patients, authors should carefully evaluate the domains and items outlined in the PRIRATE 2020 guidelines when preparing manuscripts³⁸.

In summary, there is substantial evidence to suggest that when authors adhere to specific reporting guidelines, an improvement in the overall quality of the manuscript occurs.

11. CONCLUSION

The majority of scientific reports in medicine and dentistry fail to include critical information that is required to adequately evaluate their methodological rigor, validity of their results and conclusions, as well as their clinical relevance. Without clear, accurate, transparent, and complete reporting, it is impossible to systematically identify flaws or bias. It is also impossible to use the findings to conduct systematic reviews and to apply them, with confidence, in clinical decision making. Reporting guidelines aid authors in the production of high-quality articles and it is recommended that authors submitting manuscripts to *Dental Traumatology* should utilise the relevant PRIDE guidelines to increase the overall quality of the reports they submit to the journal.

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