

Reporting Quality of Prosthodontics-Related Systematic Reviews in SCI-E Indexed Journals: A PRISMA-Based Evaluation Short Title: Reporting Quality of Prosthodontics-Related Systematic Reviews

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Abstract

Purpose: This study aimed to evaluate the reporting quality of prosthodontics-related systematic reviews indexed in the Science Citation Index Expanded (SCI-E) under the category “Dentistry, Oral Surgery & Medicine” between 2010 and 2019, using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist.

Methods: A total of 160 journals were initially screened. Studies were excluded if they were not in English, did not focus on prosthodontics based on MeSH terms, or lacked relevant publications within the specified period. Following screening and eligibility assessment, 40 meta-analysis articles with accessible full texts were included. Each article was evaluated using a detailed PRISMA-based scoring system. Reporting scores were analyzed according to publication year, number of authors, journal type, and geographic region. Multiple linear regression analysis was performed to identify independent predictors of PRISMA scores.

Results: PRISMA scores ranged from 34.0 to 50.5 out of a maximum of 55.0. Articles published after 2015 had significantly higher scores ($p = 0.002$). No significant differences were found based on number of authors ($p = 0.354$), journal type ($p = 0.446$), or region ($p = 0.927$). According to quartile classification, 9 studies were categorized as “very high” and 11 as “low” quality. Regression analysis identified publication year as the only significant predictor ($\beta = 0.459$, $p = 0.005$).

Conclusion: Reporting quality has improved over time; however, important deficiencies remain. Strengthening adherence to PRISMA and improving methodological transparency may enhance the reliability and reproducibility of systematic reviews in dentistry.

HIGHLIGHTS

- Reporting quality of prosthodontics-related systematic reviews showed significant variability.
- Studies published after 2015 demonstrated significantly higher PRISMA compliance.
- Publication year was identified as an independent predictor of reporting quality.
- Journal type, region, and number of authors were not associated with PRISMA scores.
- Key deficiencies were observed in bias assessment and methodological transparency.

INTRODUCTION

In modern dentistry, access to up-to-date and reliable evidence is essential for delivering high-quality patient care ¹. Systematic reviews and meta-analysis are particularly useful for rapid access, and thorough evaluation for subject-specific inquiries. Evidence-based dentistry is a systematic process that involves the search and critical analysis of current scientific information related to the case (specific) and the clinical application of the result obtained with the knowledge and skills of the general practitioner ^{2,3}. The 6S pyramid has been developed to facilitate this process, to categorize the information in the scientific literature, to promote evidence-based treatment practices, and to increase the reliability and quality of health care. The evidence in each subsequent step of the 6S pyramid synthesizes and summarizes the previous information. Therefore, the validity of the evidence increases towards the top of the pyramid ⁴.

The ever-increasing use of social media platforms, and virtual information repositories facilitates information sharing, and access to information; however, it may also cause an information epidemic. The information epidemic, defined as infodemic by the World Health Organization, is a mass of excess information in digital and physical environments that can harm health and cause confusion ⁵. The infodemic also includes disinformation, which is misleading, biased, and manipulated information presented consciously, and misinformation, which describes information that is spread consciously or unconsciously ⁶.

The 6s pyramid is of great importance today to reduce the negative impact of infodemia on healthcare and prevent possible incorrect treatment practices ⁷. Dentists' interest in secondary (filtered) studies in the evidence pyramid (i.e., systematic reviews) is increasing daily. Systematic reviews (SR) aim to examine databases in line with the answerable question (research question), synthesize and report the results of the studies selected according to certain criteria, and present evidence-based information to clinicians and researchers with minimal bias ⁸.

Unlike narrative reviews, an ideal SR aims to systematically identify all relevant studies on the topic, to evaluate the reviewed studies in a critically appraised, unbiased, and comprehensive manner, and to interpret (summarize) them uniformly⁹. The studies included in a SR may differ regarding setting, population, sampling, study design, and/or outcome assessment. These differences between individual studies may lead to heterogeneity and inconsistent findings in SRs^{8,10}. In summary, the biggest disadvantage of a systematic review is its dependence on the quality of the primary studies. A meta-analysis integrates a statistical synthesis to a systematic review; it combines the results of systematically reviewed studies to analyze the aggregated data with statistical methods, to present quantitative results, either as an overall measure or presenting the heterogeneity across the studies, as needed. Not all systematic reviews lead to a meta-analysis, though, due to publication bias, data access problems, insufficient data, and/or heterogeneity between studies. A valid meta-analysis is based on comparable studies: This requires similarities in patient population, treatment method(s) applied, measurement tools, and outcomes evaluation, in comparable time sequence^{11,12}.

Systematic reviews, which have contributed greatly to the development of evidence-based medicine and evidence-based dentistry, are often preferred for special issues of scientific journals. Both the basic philosophy and the workflow of special issues are different from the regular issues of dentistry journals. Special issues of journals include an index of articles on a particular topic reviewed by experts in the field who are invited as guest editor, who has strong connections with research communities¹³. Since these articles are often cited more than those published in standard (regular) issues, special issues promote the impact factor of the journal, reaching to a wider audience. In addition, special issues provide the opportunity to examine and compare relevant studies in trendy topics, provide clear evidence-based information for clinical practice, and identify topics and directions for scientific research in line with analytical and experimental approaches.

For valid and reliable application of up-to-date literature in clinical practice, methodologically robust SRs and meta-analyses (MASR) are critical. In order to improve the methodological quality of MASRs and to ensure the validity/reliability of the information presented, various reporting systems and guidelines are recommended for researchers who prepare systematic reviews with meta-analysis (MASR), and/or evaluate existing MASRs¹⁴. One of the most preferred reporting systems is PRISMA statement/checklist. The PRISMA checklist consists of 27 items, including inclusion criteria, bias assessments, results' synthesis method, limitations of the review, and recommendations for new studies¹². Reporting of a MASR will certainly be important for transparency and reproducibility of the work established.

This study aimed to assess the **reporting quality** of systematic reviews with meta-analyses on prosthodontics published in 2010–2019 in special issues of SCI-expanded journals in dentistry, oral surgery, and medicine using the PRISMA checklist. To our knowledge, no previous study has evaluated PRISMA compliance of prosthodontics-related meta-analyses in special issues of SCI-E indexed journals.

MATERIAL AND METHOD

Search strategy and inclusion criteria for journals

The websites of each of the 160 journals in the SCI-expanded list were examined; the journals whose publication language was English and whose aims and scope were related to prosthodontics, according to MeSH terms prosthesis, were selected. Analysis was restricted to the special issues of these journals between 2009 and 2019. The journal press house, country, field, mode of access, 5-year impact factor, partners, quartile in category information on the web pages, and web of science web page of the journals with special issues were recorded (Table 1). For special issues with a preface, reviewer information (PR), mode of access, and supporting foundation information were noted (Table 1). The titles, keywords, and abstracts of the articles in the special issues were then evaluated according to MeSH terms prosthodontics (<https://www.ncbi.nlm.nih.gov/mesh/?term=prosthodontics>), and systematic reviews with meta-analysis were selected for final evaluation. The review of journals, special issues, and selection of articles for inclusion in the final review was carried out independently and in duplicate by two calibrated researchers (KA, NB). In case of differences of opinion, a consensus was reached after discussion. Full texts of all articles potentially eligible for the study were evaluated. The flow diagram of the journal screening and article selection process is presented in Fig. 1. Information on the journals and special issues reviewed is summarized in Table 1.

Table 1
Basic Characteristics of the Journals Included in the Study

No	Article Title	First Author Name*	Number of Authors	Journal Name	Year of Publication	Impact Factor
1	Loading Protocols for Mandibular Implant Overdentures: A Systematic Review with Meta-Analysis	Alsabeeha_2010	3	Clinical Implant Dentistry and Related Research	2010	3.214
2	Surgical protocols for ridge preservation after tooth extraction. A systematic review	Vigonletti_2012	6	Clinical Oral Implants Research	2012	3.433
3	A systematic review on survival and success rates of implants placed immediately into fresh extraction sockets after at least 1 year	Lang_2012	5	Clinical Oral Implants Research	2012	3.433
4	Surgical protocols for early implant placement in post-extraction sockets: a systematic review	Sanz_2012	6	Clinical Oral Implants Research	2012	3.433
5	What is the optimal number of implants for removable reconstructions? A systematic review on implant-supported overdentures	Ruccuzzo_2012	5	Clinical Oral Implants Research	2012	3.433
6	A systematic review of the survival and complication rates of implant-supported fixed dental prostheses (FDPs) after a mean observation period of at least 5 years	Pjetursson_2012_COIR	5	Clinical Oral Implants Research	2012	3.433
7	Systematic review of the survival rate and the incidence of bio- logical, technical, and aesthetic complications of single crowns on implants reported in longitudinal studies with a mean follow-up of 5 years	Jung_2012	5	Clinical Oral Implants Research	2012	3.433
8	Systematic review of the survival rate and the biological, technical, and aes- thetic complications of fixed dental prostheses with cantilevers on implants reported in longitudinal studies with a mean of 5 years follow-up	Romeo_2012	2	Clinical Oral Implants Research	2012	3.433
9	Survival rates of short dental implants (≤ 6 mm) compared with implants longer than 6 mm in posterior jaw areas: A meta-analysis	Papaspyridakos_2018	6	Clinical Oral Implants Research	2018	3.825
10	Narrow-diameter implants: A systematic review and meta-analysis	Schiegnitz_2018	2	Clinical Oral Implants Research	2018	3.825
11	The diagnosis of peri-implantitis: A systematic review on the predictive value of bleeding on probing	Hashim_2018	4	Clinical Oral Implants Research	2018	3.825
12	The accuracy of different dental impression techniques for implant-supported dental prostheses: A systematic review and meta-analysis	Flügge_2018	6	Clinical Oral Implants Research	2018	3.825
*First author's last name_the year of publication.						
-Within the scope of this study, the journal previously titled European Journal of Oral Implantology was renamed International Journal of Oral Implantology in 2018.						

No	Article Title	First Author Name*	Number of Authors	Journal Name	Year of Publication	Impact Factor
13	Clinical outcomes of peri-implantitis treatment and supportive care: A systematic review	Ruccuzzo_2018	4	Clinical Oral Implants Research	2018	3.825
14	Number of implants placed for complete-arch fixed prostheses: A systematic review and meta-analysis	Polido_2018	5	Clinical Oral Implants Research	2018	3.825
15	Performance and outcome of zirconia dental implants in clinical studies: A meta-analysis	Roehling_2018	4	Clinical Oral Implants Research	2018	3.825
16	Effect of advanced age and/or systemic medical conditions on dental implant survival: A systematic review and meta-analysis	Schimmel_2018	4	Clinical Oral Implants Research	2018	3.825
17	Patient-reported outcome measures focusing on aesthetics of implant- and tooth-supported fixed dental prostheses: A systematic review and meta-analysis	Wittneben_2017	5	Clinical Oral Implants Research	2018	3.825
18	Biological and technical complications of tilted implants in comparison with straight implants supporting fixed dental prostheses. A systematic review and meta-analysis	Alccayhuaman_2018	6	Clinical Oral Implants Research	2018	3.825
19	Frequency of infraposition and missing contact points in implant-supported restorations within natural dentitions over time: A systematic review with meta-analysis	Papageorgiou_2018	3	Clinical Oral Implants Research	2018	3.825
20	Biological effect of the abutment material on the stability of peri-implant marginal bone levels: A systematic review and meta-analysis	Sans_Sanchez_2018	5	Clinical Oral Implants Research	2018	3.825
21	Implant supported cantilevered fixed dental rehabilitations in partially edentulous patients: Systematic review of the literature. Part I.	Storelli_2018	6	Clinical Oral Implants Research	2018	3.825
22	Clinical outcomes of partial and full-arch all-ceramic implant-supported fixed dental prostheses. A systematic review and meta-analysis	Pieralli_2018	6	Clinical Oral Implants Research	2018	3.825
23	The clinical performance of all-ceramic implant-supported single crowns: A systematic review and meta-analysis	Rabel_2018	5	Clinical Oral Implants Research	2018	3.825
24	Functional jaw muscle assessment in patients with a full fixed prosthesis on a limited number of implants: a review of the literature	Dellavia_2014	4	European Journal of Oral Implantology	2014	3.136
25	The fate of marginal bone around axial vs. tilted implants: a systematic review	Fabbro_2014	2	European Journal of Oral Implantology	2014	3.136
*First author's last name_the year of publication.						
-Within the scope of this study, the journal previously titled European Journal of Oral Implantology was renamed International Journal of Oral Implantology in 2018.						

No	Article Title	First Author Name*	Number of Authors	Journal Name	Year of Publication	Impact Factor
26	A systematic review of implant-supported overdentures in the edentulous maxilla. compared to the mandible: how many implants?	Raghoobar_2014	5	European Journal of Oral Implantology	2014	3.136
27	Impact of prosthetic material on mid- and long- term outcome of dental implants supporting single crowns and fixed partial dentures: A systematic review and meta-analysis	Abou-Ayash_2017	4	European Journal of Oral Implantology	2017	2.809
28	Long-term clinical outcome of implants with different surface modifications	Wennerberg_2018	3	European Journal of Oral Implantology	2018	2.513
29	Loading protocols for single-implant crowns: a systematic review and meta-analysis	Benic_2014	3	The International Journal of Oral & Maxillofacial Implants	2014	1.491
30	Systematic review on success of narrow-diameter dental implants	Marc O. Klein_2014	3	The International Journal of Oral & Maxillofacial Implants	2014	1.491
31	Systematic review of the survival rate and incidence of biologic, technical, and esthetic complications of single implant abutments supporting fixed prostheses	Zembic_2014	4	The International Journal of Oral & Maxillofacial Implants	2014	1.491
32	Implant loading protocols for partially edentulous patients with extended edentulous sites—a systematic review and meta-analysis	Schrott_2014	4	The International Journal of Oral & Maxillofacial Implants	2014	1.491
33	Implant loading protocols for edentulous patients with fixed prostheses: a systematic review and meta-analysis	Papaspyridakos_2014	4	The International Journal of Oral & Maxillofacial Implants	2014	1.491
34	Clinical Performance of Screw-Versus Cement-Retained Fixed Implant-Supported Reconstructions —A Systematic Review	Wittneben_2014	3	The International Journal of Oral & Maxillofacial Implants	2014	1.491
35	Loading Protocols for Implant-Supported Overdentures in the Edentulous Jaw: A Systematic Review and Meta-Analysis	Schimmel_2014	4	The International Journal of Oral & Maxillofacial Implants	2014	1.491
36	Peri-implant health and disease. A systematic review of current epidemiology	Derks_2015	2	Journal of Clinical Periodontology	2015	3.915
37	Is there an effect of crown-to-implant ratio on implant treatment outcomes? A systematic review	Meijer_2018	4	Clinical Oral Implants Research	2018	3.825
38	Quality of reporting of clinical studies to assess and compare performance of implant- supported restorations	Pjetursson_2012	3	Journal of Clinical Periodontology	2012	3.688
39	Long-term effectiveness of maxillary sinus floor augmentation: A	Raghoobar_2019	5	Journal of Clinical Periodontology	2019	5.241
*First author's last name_the year of publication.						
-Within the scope of this study, the journal previously titled European Journal of Oral Implantology was renamed International Journal of Oral Implantology in 2018.						

No	Article Title	First Author Name*	Number of Authors	Journal Name	Year of Publication	Impact Factor
	systematic review and meta-analysis					
40	The effectiveness of immediate implant placement for single tooth replacement compared to delayed implant placement: A systematic review and meta-analysis	Cosyn_2018	5	Journal of Clinical Periodontology	2019	5.241
*First author's last name_the year of publication.						
-Within the scope of this study, the journal previously titled European Journal of Oral Implantology was renamed International Journal of Oral Implantology in 2018.						

Exclusion criteria

Special issues published in the form of congress abstracts, those missing keywords in MeSH term prosthodontics, those in the form of narrative communication, literature reviews, narrative reviews, historical reviews, and systematic reviews that do not contain meta-analytic assessment were excluded (Fig. 1).

Compliance with PRISMA Checklist

The two independent evaluators (XX, YYY) appointed for evaluating the compliance of selected meta-analyses with PRISMA reporting guideline were first instructed on how to use the PRISMA checklist, with a pre-established, standardized scoring system. This scoring system enabled a thorough, and comparable evaluation of compliance with all substatements of the PRISMA checklist, rather than PRISMA's grades of "information available, information not available, information insufficient" (Appendix 1). Equal weights were assigned to all subsections, with a maximum potential score of 55.0.

Following a thorough review of what to look for in each reporting section, two reviewers evaluated 3 meta-analysis manuscripts, not included in the study, blinded to each others grading. Correlation was full between the readers, thus, no further reliability analysis was needed. Consequently, all selected articles were independently read and scored by two investigators (NB, ŞAK) and the scores were compared at a joint meeting. The senior researcher (BÇ) was consulted in case of disagreement and/or when further methodologic information was needed.

This article was conducted and reported in accordance with the PRISMA 2020 statement. This study was not registered in PROSPERO.

Data analysis

The revised PRISMA checklist was used for the analyses, using the custom-made scoring (Appendix 1). Each article was first assigned a reporting score. Reporting scores were compared and contrasted across the manuscripts, using mean, standard deviation, median, first and third quartile values. Distributions of reporting scores were further evaluated by some identifying characteristics, such as the number of authors and the region where the article was published. With the total score showing normal distribution (with Shapiro-Wilk test), group comparisons were established using Independent samples t-test and One-Way ANOVA test. Using quartiles, the reporting value of individual articles were grouped as 'low' (38.1 or below), 'moderate' (38.2–42.7), high (42.8–47.2), and very high (47.3 or above). The number and percentage of articles that received the highest possible score value from sub-sections were also noted in the supplement section. A multiple linear regression analysis was performed to identify independent factors associated with PRISMA total scores.

RESULTS

The summaries of the meta-analyses included in our study are presented in Table 1, including the title, name of the first author, the total number of authors, year of publication, and the impact factor of the journal in the year it was published.

Table 2 presents the total reporting score calculated for the meta-analyses studied. Out of a maximum potential score of 55.0, scores ranged between 34.0 and 50.0.

Table 2
Distribution of Scores per Question Based on the Evaluation of PRISMA Reporting Guideline Compliance for the Included Articles

No	First Author_Year	Total Score	Mean $\pm$ SD*	Median	1st–3rd Quartiles
1	Alsabeeha_2010	43.5	1.61 $\pm$ 1.65	1.0	1.0–2.0
2	Vigonletti_2012	48.5	1.79 $\pm$ 1.53	1.0	1.0–2.0
3	Lang_2012	39.5	1.46 $\pm$ 1.58	1.0	1.0–2.0
4	Sanz_2012	46.5	1.72 $\pm$ 1.54	1.0	1.0–2.0
5	Ruccuzzo_2012	36.0	1.33 $\pm$ 1.66	1.0	0.0–1.0
6	Pjetursson_2012_COIR	35.5	1.24 $\pm$ 1.64	1.0	0.0–1.0
7	Jung_2012	36.0	1.33 $\pm$ 1.56	1.0	0.0–2.0
8	Romeo_2012	35.0	1.27 $\pm$ 1.37	1.0	1.0–1.0
9	Papaspyridakos_2018	43.0	1.59 $\pm$ 1.69	1.0	1.0–2.0
10	Schiegnitz_2018	47.5	1.72 $\pm$ 1.73	1.0	1.0–2.0
11	Hashim_2018	46.5	1.72 $\pm$ 1.63	1.0	1.0–2.0
12	Flügge_2018	40.0	1.50 $\pm$ 1.81	1.0	1.0–2.0
13	Ruccuzzo_2018	49.5	1.79 $\pm$ 1.53	1.0	1.0–2.0
14	Polido_2018	42.5	1.57 $\pm$ 1.60	1.0	1.0–2.0
15	Roehling_2018	40.5	1.53 $\pm$ 1.78	1.0	1.0–2.0
16	Schimmel_2018	49.0	1.85 $\pm$ 1.60	1.0	1.0–2.0
17	Wittneben_2017	49.0	1.81 $\pm$ 1.64	1.0	1.0–2.0
18	Alccayhuaman_2018	50.5	1.87 $\pm$ 1.68	1.0	1.0–2.0
19	Papageorgiou_2018	47.5	1.83 $\pm$ 1.57	1.0	1.0–2.0
20	Sans_Sanchez_2018	47.5	1.75 $\pm$ 1.39	1.0	1.0–2.0
21	Storelli_2018	42.0	1.59 $\pm$ 1.62	1.0	1.0–2.0
22	Pieralli_2018	43.5	1.64 $\pm$ 1.51	1.0	1.0–2.0
23	Rabel_2018	43.5	1.63 $\pm$ 1.43	1.0	1.0–2.0
24	Dellavia_2014	38.0	1.37 $\pm$ 1.62	1.0	0.0–2.0
25	Fabbro_2014	39.5	1.38 $\pm$ 1.70	1.0	1.0–2.0
26	Raghoobar_2014	37.5	1.44 $\pm$ 1.75	1.0	1.0–2.0
27	Abou-Ayash_2017	41.0	1.51 $\pm$ 1.47	1.0	1.0–2.0
28	Wennerberg_2018	38.0	1.40 $\pm$ 1.44	1.0	1.0–2.0
29	Benic_2014	44.5	1.68 $\pm$ 1.69	1.0	1.0–2.0
30	Marc O. Klein_2014	43.5	1.57 $\pm$ 1.63	1.0	1.0–2.0
31	Zembic_2014	38.5	1.46 $\pm$ 1.65	1.0	1.0–2.0
32	Schrott_2014	44.0	1.66 $\pm$ 1.59	1.0	1.0–2.0
33	Papaspyridakos_2014	42.0	1.59 $\pm$ 1.48	1.0	1.0–2.0
34	Wittneben_2014	36.0	1.37 $\pm$ 1.71	1.0	1.0–1.0
*SD: Standard Deviation					

No	First Author_Year	Total Score	Mean $\pm$ SD*	Median	1st–3rd Quartiles
35	Schimmel_2014	44.5	1.64 $\pm$ 1.60	1.0	1.0–2.0
36	Derks_2015	41.5	1.53 $\pm$ 1.52	1.0	1.0–2.0
37	Meijer_2018	36.0	1.37 $\pm$ 1.67	1.0	1.0–1.0
38	Pjetursson_2012	34.0	1.29 $\pm$ 1.63	1.0	0.5-1.0
39	Raghoobar_2019	47.5	1.75 $\pm$ 1.51	1.0	1.0–2.0
40	Cosyn_2018	50.0	1.88 $\pm$ 1.57	1.0	1.0–2.0
*SD: Standard Deviation					

Reviewed articles were mainly published in Clinical Oral Implants Research; 87.5% (n = 35) of the articles had a first author from the European Region; more than half of the articles had five or more authors (Table 3).

Table 3
Journal Titles, Publication Regions, and Number of Authors of the Reviewed Articles

Variable	Sub-groups	Percentage (number)
Journal	Clinical Oral Implants Research	57.5 (23)
	The International Journal of Maxillofacial Implants	17.5 (7)
	European Journal of Oral Implantology	12.5 (5)
	Journal of Clinic Periodontology	10.0 (4)
	Clinical Implant Dentistry and Related Research	2.5 (1)
Region	Europe	87.5 (35)
	America	7.5 (3)
	Asia	2.5 (1)
	Zealandia	2.5 (1)
Number of Authors	2	10.0 (4)
	3	17.5 (7)
	4	27.5 (11)
	5	27.5 (11)
	6	17.5 (7)
Total		100.0 (40)
-Within the scope of this study, the journal previously titled European Journal of Oral Implantology was renamed International Journal of Oral Implantology in 2018.		

The distribution of scores obtained from sections of the PRISMA Checklist is presented in Table 4.

Table 4
Distribution of Scores Obtained by Sections of PRISMA Reporting Guideline

No	First Author_Year	Title	Abstract	Introduction	Methods	Section/Topic	Results	Discussion	Funding
1	Alsabeeha_2010	2,0	8,5	5,0	13,0	1,0	11,0	3,0	-
2	Vigonletti_2012	1,0	8,0	5,5	15,0	3,0	13,0	3,0	-
3	Lang_2012	1,0	8,0	5,5	12,0	1,0	9,0	2,0	1,0
4	Sanz_2012	1,0	8,0	5,5	15,0	2,0	12,0	3,0	-
5	Ruccuzzo_2012	1,0	8,0	5,0	9,0	1,0	9,0	3,0	-
6	Pjetursson_2012_COIR	1,0	8,0	4,5	9,0	-	8,0	3,0	-
7	Jung_2012	1,0	7,5	4,5	11,0	1,0	9,0	2,0	-
8	Romeo_2012	1,0	7,0	4,5	10,0	1,0	8,0	3,0	-
9	Papaspyridakos_2018	1,0	8,0	6,0	14,0	-	10,0	3,0	1,0
10	Schiegnitz_2018	2,0	9,0	5,5	12,0	2,0	12,0	3,0	1,0
11	Hashim_2018	1,0	9,0	4,5	12,0	3,0	13,0	3,0	1,0
12	Flügge_2018	2,0	9,0	5,5	11,0	1,0	9,0	3,0	-
13	Ruccuzzo_2018	1,0	8,5	4,0	16,0	3,0	13,0	3,0	-
14	Polido_2018	2,0	8,0	5,5	12,0	1,0	11,0	3,0	-
15	Roehling_2018	1,0	9,0	4,5	14,0	1,0	9,0	3,0	-
16	Schimmel_2018	2,0	8,5	5,5	15,0	3,0	12,0	3,0	1,0
17	Wittneben_2017	2,0	9,0	5,0	13,0	3,0	13,0	3,0	1,0
18	Alccayhuaman_2018	2,0	9,0	5,5	14,0	3,0	13,0	3,0	1,0
19	Papageorgiou_2018	2,0	8,5	5,0	16,0	2,0	12,0	3,0	1,0
20	Sans_Sanchez_2018	2,0	7,5	5,0	15,0	2,0	12,0	3,0	1,0
21	Storelli_2018	1,0	8,5	4,5	14,0	1,0	11,0	3,0	0,0
22	Pieralli_2018	2,0	8,0	4,5	14,0	1,0	11,0	3,0	1,0
23	Rabel_2018	2,0	7,5	4,5	14,0	1,0	11,0	3,0	1,0
24	Dellavia_2014	0,0	7,5	5,5	11,0	1,0	9,0	3,0	0,0
25	Fabbro_2014	1,0	8,0	5,5	11,0	1,0	9,0	2,0	0,0
26	Raghoobar_2014	1,0	8,5	5,5	12,0	0,0	8,0	3,0	1,0
27	Abou-Ayash_2017	2,0	8,0	5,0	12,0	2,0	9,0	3,0	0,0
28	Wennerberg_2018	0,0	6,5	5,5	12,0	1,0	9,0	3,0	1,0
29	Benic_2014	2,0	8,5	6,0	13,0	1,0	11,0	3,0	1,0
30	Marc O. Klein_2014	1,0	8,0	5,5	11,0	2,0	12,0	3,0	0,0
31	Zembic_2014	1,0	8,0	5,5	11,0	1,0	9,0	3,0	1,0
32	Schrott_2014	2,0	8,5	4,5	14,0	1,0	11,0	3,0	1,0
33	Papaspyridakos_2014	2,0	7,5	5,5	15,0	1,0	9,0	3,0	0,0
34	Wittneben_2014	1,0	8,0	6,0	9,0	1,0	9,0	3,0	0,0
35	Schimmel_2014	2,0	8,0	5,5	14,0	1,0	11,0	2,0	1,0

No	First Author_Year	Title	Abstract	Introduction	Methods	Section/Topic	Results	Discussion	Funding
36	Derks_2015	1,0	8,0	4,5	12,0	1,0	11,0	3,0	1,0
37	Meijer_2018	1,0	8,5	4,5	10,0	1,0	9,0	3,0	0,0
38	Pjetursson_2012	0,0	8,0	5,5	8,0	1,0	8,5	3,0	1,0
39	Raghoobar_2019	2,0	8,0	5,5	14,0	2,0	12,0	3,0	1,0
40	Cosyn_2018	2,0	8,5	5,5	15,0	3,0	13,0	3,0	1,0

With a 5-year grouping, based on publication year, 20 articles published in 2015 or earlier had a total score of 804, whereas 20 articles published in 2016 or later had a total score of 894.5. This increase in reporting scores was statistically significant (Independent t-test, $p = 0.002$). When the number of authors was grouped as 2–4 authors versus 5–6 authors, the difference in total PRISMA scores was not statistically significant (Independent t-test, $p = 0.354$). Similarly, distribution of reporting scores based on compliance with PRISMA guidelines was not statistically significantly different by journal type ($p = 0.446$) and region of publication ($p = 0.927$).

The reporting scores obtained were further grouped according to quartiles. Accordingly, A total of 9 articles were classified in the "Very High" group, while 11 articles were in the "Low" group (Table 5).

Table 5
Detailed PRISMA Scores for Each Article by Journal and PRISMA Checklist Item

No	First Author_Year	Total Score Obtained	Reporting Quality based on Quartiles*
1	Alsabeeha_2010	43.5	High
2	Vigonletti_2012	48.5	Very High
3	Lang_2012	39.5	Moderate
4	Sanz_2012	46.5	High
5	Ruccuzzo_2012	36.0	Low
6	Pjetursson_2012_COIR	35.5	Low
7	Jung_2012	36.0	Low
8	Romeo_2012	35.0	Low
9	Papaspyridakos_2018	43.0	Low
10	Schiegnitz_2018	47.5	Very High
11	Hashim_2018	46.5	High
12	Flügge_2018	40.0	Moderate
13	Ruccuzzo_2018	49.5	Very High
14	Polido_2018	42.5	Moderate
15	Roehling_2018	40.5	Moderate
16	Schimmel_2018	49.0	Very High
17	Wittneben_2017	49.0	Very High
18	Alccayhuaman_2018	50.5	Very High
19	Papageorgiou_2018	47.5	Very High
20	Sans_Sanchez_2018	47.5	Very High
21	Storelli_2018	42.0	Moderate
22	Pieralli_2018	43.5	High
23	Rabel_2018	43.5	High
24	Dellavia_2014	38.0	Low
25	Fabbro_2014	39.5	Moderate
26	Raghoobar_2014	37.5	Low
27	Abou-Ayash_2017	41.0	Moderate
28	Wennerberg_2018	38.0	Low
29	Benic_2014	44.5	High
30	Marc O. Klein_2014	43.5	High
31	Zembic_2014	38.5	Moderate
32	Schrott_2014	44.0	High
33	Papaspyridakos_2014	42.0	Moderate
34	Wittneben_2014	36.0	Low
* The scores were evaluated in terms of quality by grouping them according to quartiles: 0–1st quartile: Low 1st–2nd quartile: Moderate 2nd–3rd quartile: High Above the 3rd quartile: Very High			

No	First Author_Year	Total Score Obtained	Reporting Quality based on Quartiles*
35	Schimmel_2014	44.5	High
36	Derks_2015	41.5	Moderate
37	Meijer_2018	36.0	Low
38	Pjetursson_2012	34.0	Low
39	Raghoobar_2019	47.5	Very High
40	Cosyn_2018	50.0	Very High
* The scores were evaluated in terms of quality by grouping them according to quartiles: 0–1st quartile: Low 1st–2nd quartile: Moderate 2nd–3rd quartile: High Above the 3rd quartile: Very High			

Box plots showing the scores of article sections after percentage calculations for each section are presented below (Fig. 2).

A multiple linear regression analysis was conducted to identify factors associated with PRISMA total scores. The model was statistically significant ($F = 2.737$, $p = 0.044$) and explained 23.8% of the variance in reporting quality ($R^2 = 0.238$). Among the variables included in the model, only publication year was found to be a significant predictor of PRISMA scores ($\beta = 0.459$, $p = 0.005$). Each unit increase in publication year was associated with an increase of 4.346 points in PRISMA score. Journal group, region of publication, and number of authors were not significantly associated with reporting quality ($p > 0.05$) (Table 6).

Table 6
Linear Regression Analysis for Factors Associated with PRISMA Total Scores

Variable	B	Std. Error	Beta	t	p	95% CI (Lower–Upper)	VIF
Constant	34.766	5.548	–	6.266	< 0.001	23.50–46.03	–
Publication year	4.346	1.444	0.459	3.009	0.005	1.41–7.27	1.069
Journal group	-0.298	0.687	-0.066	-0.433	0.668	-1.69–1.09	1.076
Region	0.432	1.247	0.052	0.347	0.731	-2.10–2.96	1.045
Number of authors	0.516	1.485	0.054	0.348	0.730	-2.49–3.53	1.119
R	R ²	Adjusted R ²		F	p		
0.488	0.238	0.151		2.737	0.044		

DISCUSSION

In recent years, systematic reviews and meta-analyses became the focus of attention of clinicians and researchers as a thorough means of rapid access to specific literature. Accordingly, special issues of many journals are spared for MASRs, and such issues have been increasing steadily. The impact of this on the quality and reliability of SR and Meta-analyses' reportings is of critical importance on clinical practices. This study aimed to examine the reporting quality of prosthesis-related meta-analyses in special issues of journals according to the PRISMA checklist. To the best of our knowledge, this is the first study in this field, evaluating the quality of MASRs in special issues of journals. A total of 16 journals with aims and scope related to prosthetics, published between 2010 and 2019, were examined and 40 articles were identified for reporting quality assessment.

Based on the bibliographic data of the journals examined, the main area of interest was implantology and the main partners on the web pages of the journals were funds and organizations related to implantology. As implant-supported applications have become a proven clinical treatment option, the interest of researchers in this field has increased in parallel. Over the last 5 years, both implant-related scientific publications¹⁵, and the underlying clinical applications have increased in number and so been the investors' interest and funding support in implant-related practices¹⁶. Our clinical experience reveal that state and foundation research universities, various companies, and organizations are financial supporting research in implantology. Similarly, our work with special issues of implantology journals, with main funding support by institutions related to implantology suggest that the industry has a major driving force on scientific research.

It is known that the preparation process of journals' special issues is usually initiated by an academic expert in the field who is invited as a guest editor¹³. For this reason, the effect of the invited editor on this process, with transparency in article selection is of interest. However, some of the special issues examined in our study did not have a preface, whilst the majority of prefaces, when present, lacked information about the article evaluation process, and the details of the peer review process. Of the 40 articles we examined, 39 were reportedly presented earlier at congresses organized by five different organizations; of these two were non-profit organizations (EAO, EFP) and three private company-supported (ITI, FOR, Osteology Foundation). This suggested that either the authors would complete their work after congress presentations and would like to publish afterwards, or the editors might invite selected presentations' authors to publish in their journals. In either condition, it seems more likely that the probability of a publication increases with earlier feedback from related field's academicians. Considering that most of the special issues selected for the study were presented at congresses organized by EAO and ITI, it is unsurprising that 57.5% of the articles included in the final evaluation were published in JOIR, the official journal of EAO, supporting our latter hypothesis^{17,18}.

Despite the information about funding support in the prefaces, only 1 out of 5 articles had an explanation about funding support in their full text. The readers would like to be informed of the funding (if any), thus, it is not sufficient to provide information on funding support only in the preface. It has been emphasized in earlier literature that lack of information on funding may raise questions about authors' conflict of interest on the topic and/or might question the independence of firms^{17,18}. We highly recommend future authors to consider this issue in preparing their articles.

Most of the journals we examined required a subscription for full-text access, even for supplements, restricting their readability in developing countries, in particular. Some of the articles in the supplements were open access, which may be the journal's editorial policy to promote the audience size of their special issues.

The titles and abstracts of the articles published in journal requiring subscription for full-text access are critical for readers and researchers. Only 18 of the 40 meta-analyses included in our study included study design in their title; 21 articles did so in their abstract or full text. This underscore the importance of integrating study design in either the title or the abstract, so that the readers interested in specific study designs can reach those in quick literature searches.

None of the abstracts of the analyzed meta-analyses received a full score of reporting quality. The score correlation of the examined abstracts ranged between 6.5-9, with a mean score of 8.16. The abstracts generally lacked sufficient information on background, study appraisal and synthesis methods, limitations, and registration processes. Our finding was in consistency with earlier work in literature on different health topics, recommending a need to improve writing of study abstracts¹⁹. The abstract plays an important role in assessing the validity of the study findings, clarifying the applicability of its results, and facilitating the peer review process. Abstracts are invaluable for rapid assessment of study findings and time-and effort-efficient interpretations of the individual studies for readers with restricted ability to reach full texts, in particular²⁰. A study evaluating more than 23 million users/sessions and more than 58 million user queries revealed that readers viewed the top 20 articles in the search engine, and that the frequency of clicking on article abstracts was 2.5 times that established for full-text the article²¹. The word restriction imposed by most journals may cause the lack of information in the abstract, though. In order to prevent unnecessary words in abstracts without ignoring important information, journal editors may be recommended to prepare the abstract format in line with the contents of checklists, such as PRISMA, STROBE, or CONSORT, based on the study design used.

Another important issue to ensure standardization between studies, avoiding information duplications is citing study protocol in references. Only seven (12.5%) articles we evaluated had information on the study protocol. Flemming et al. reported that non-Cochrane reviews often lacked registration information for study protocols¹⁷. The same study concluded that the reporting quality of Cochrane systematic reviews was statistically higher than that of non-Cochrane reviews, underlining the impact of protocol registration on methodological quality of reviews. It is noteworthy to emphasize that Cochrane collaboration has strict guidelines for SRs, in line with PRISMA. Lack of protocol registration was also reported in earlier work evaluating the quality of studies published in different fields of dentistry²²⁻²⁴.

ICMJE (International Committee of Medical Journal Editors) recommends that journals insist on registering their published articles¹³. These online registration pages, prepared in line with the research checklists, improves investigator's reporting of the study design, the workflow, and the synthesis of the results, while allowing the readers' interpretations of the studies, with minimal bias²⁵.

In our study, based on the subsections of PRISMA, the items related to the identification of the clinical question for conducting studies, the creation of the answerable question (PICOS), the purpose and importance of the research, the creation of the study protocol, the limitations and results of the research received high scores. However, the search of databases revealed insufficient information on biases in the included study and between studies. For example, except for a few articles, the study question was often stated correctly and clearly. Thus, the authors may be advised to provide information on the types of studies included in the PICOS.

Another important issue we detected with individual studies was the inadequacy of statistical calculations required for meta-analysis in the studies. Additional analyses evaluated under six items in the PRISMA checklist, and the scores of the synthesis of the results ranged between 10% and 40%. Incomplete or inadequate statistical analyses, which constitute the cornerstone of meta-analysis, put the validity of meta-analyses, at risk.

It was remarkable in our work that a total of eight articles originally stated by the authors as systematic reviews with meta-analysis were found to be satisfactory as systematic reviews, yet the statistical analyses for proper meta-analyses were missing and, thus, were excluded from our final evaluation. Authors of meta-analyses are highly recommended to work with a statistician to fulfill this need and journal editors can make it mandatory, as in Cochrane collaboration's works.

Items 15 and 22 in the PRISMA checklist, which include guidelines for assessing bias between studies" and "fair, accurate reporting of results" were also scored low. This may be attributed to the importance of methodologic quality of primary studies, at first sight, yet, publication biases, insufficient reporting of biases in systematic statistical analysis of involved articles, and/or insufficient details on heterogeneity of study findings with a thorough discussion of potential reasons might have led to such deficiencies in published meta-analyses

It was remarkable in our study that meta-analyses published in 2016 and later had significantly higher reporting quality than those published earlier. In addition to the group-based comparisons, our regression analysis further confirmed that publication year was an independent predictor of reporting quality. This finding indicates that improvements in PRISMA compliance are not only observed at the descriptive level but also persist after adjusting for potential confounders such as journal type, region, and number of authors. The lack of association between journal group and reporting quality suggests that adherence to reporting guidelines may be more related to temporal awareness and evolving editorial standards rather than journal-specific policies. Similarly, the number of authors did not influence reporting quality, indicating that collaborative size alone does not guarantee better methodological reporting. These improvements over time may be attributed to increased awareness of reporting methodologies among authors, more consistent use of reporting guidelines by both authors and peer reviewers, and a growing tendency among journals to mandate adherence to standardized reporting guidelines.

Although the regression model was statistically significant, the relatively low adjusted R^2 (0.151) suggests that a substantial proportion of variability in reporting quality remains unexplained. Other factors such as peer-review processes, author expertise, and journal editorial policies may contribute to reporting quality but were not included in the model. Another important issue that attracted attention was that four of the journals in which the articles included in our final study set were published were related to implantology, and one was related to periodontology. It is noteworthy that no special issues focused specifically on prosthodontics topics such as digital workflow, digital smile design, restorative materials, or manufacturing techniques. However, these areas are critical to the success or failure of both implant- and tooth-supported treatments. This finding strengthens the evidence that improvements in reporting quality are primarily driven by temporal trends rather than journal-related or authorship-related factors.

To address this gap in the scientific literature, journals should consider revising their policies regarding special issues, and prosthodontists should participate more actively as editors in journals or special issues. Despite the high survival rates of implant-supported treatments, mechanical, biological, and aesthetic complications remain unavoidable. Considering that such complications often arise after prosthetic loading, further research in prosthodontics is essential to better understand their causes and develop preventive strategies. Special issues dedicated to these topics may encourage more focused and high-quality scientific research.

In conclusion, our findings highlight that reporting quality has improved over time, and publication year remains the most important determinant of PRISMA compliance. Despite these improvements, important deficiencies in reporting quality persist, particularly in areas related to bias assessment and methodological transparency. Strengthening adherence to reporting guidelines such as PRISMA, encouraging protocol registration, and improving editorial and peer-review processes may further enhance the quality and reliability of systematic reviews in prosthodontics.

Declarations

ETHICS APPROVAL

Not applicable.

CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

COMPETING INTEREST

The authors declare no conflict of interest with any individual and/or institution.

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Author Contribution

N.B. and Ş.A.K. contributed equally to the conception and design of the study, data collection, analysis, and manuscript drafting. B.Ç. contributed to the study design, provided methodological and epidemiological guidance, and critically revised the manuscript. K.A. contributed to the study design, provided clinical expertise in prosthodontics, and critically revised the manuscript. All authors read and approved the final manuscript.

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Not applicable.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Figures

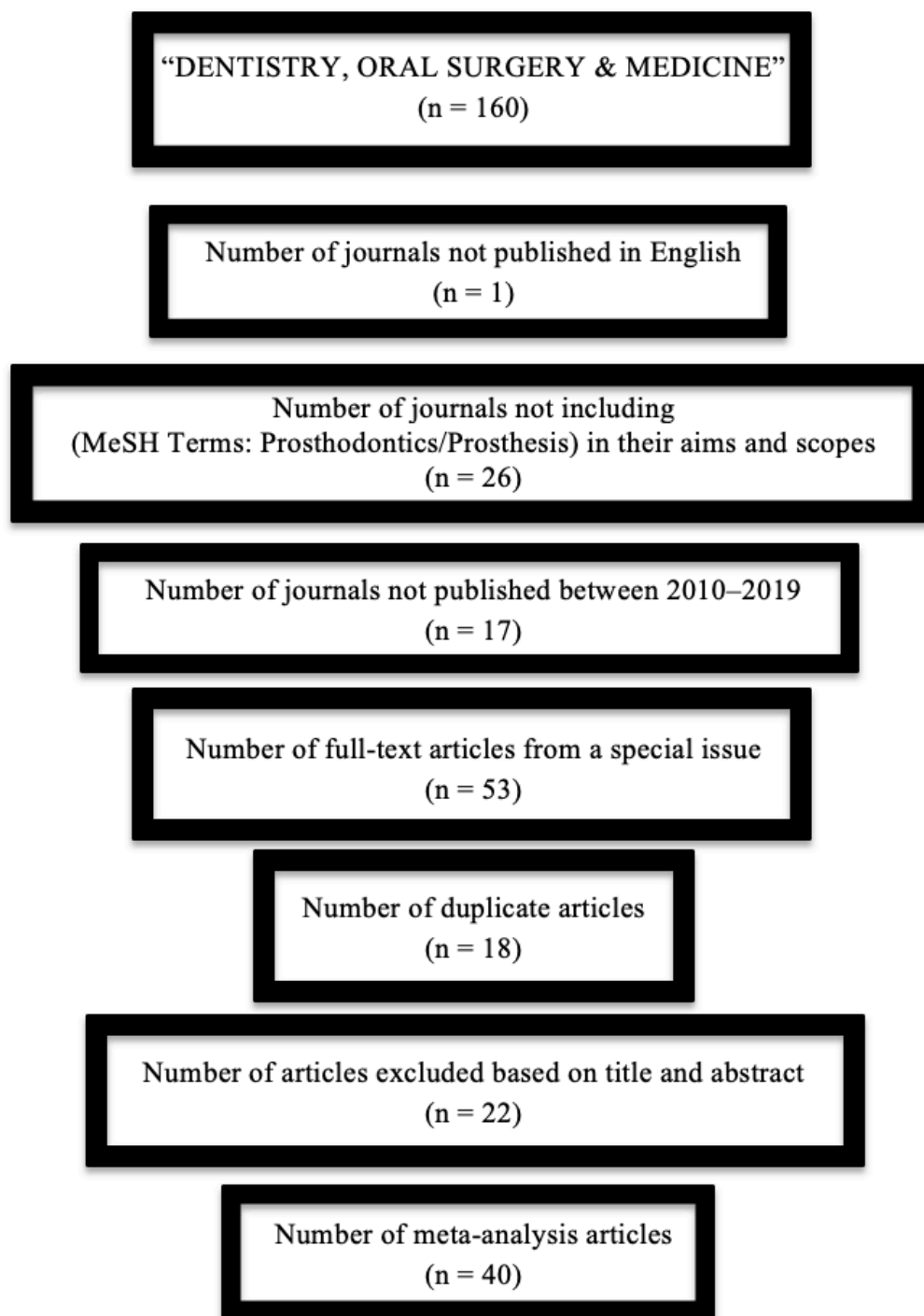


Figure 1

Flow Diagram

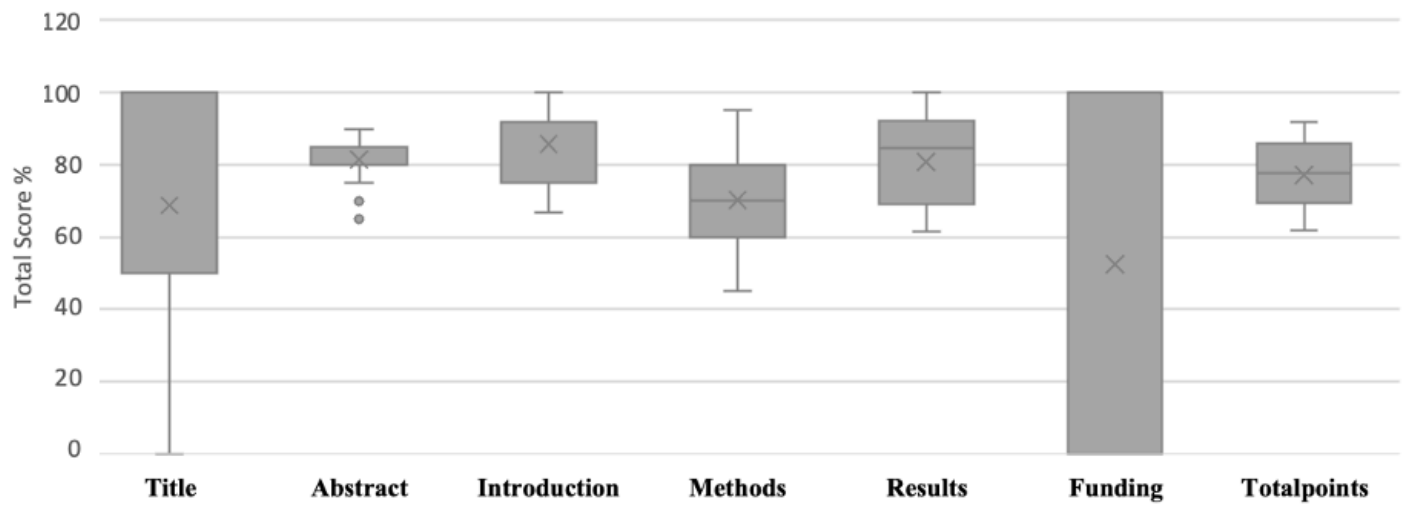


Figure 2

Section- Specific Box Plots of the Articles

*Total scores were calculated as percentage values, with the maximum possible score considered as 100%.