Topics and PRISMA Checklist Compliance for Meta-analyses in Dermatology: Journal Case Study

Meta-analyses are usually the final step of systematic reviews and provide robust scientific evidence (1,2). The Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) Statement is a useful tool to improve the reporting of meta-analyses (3).

There are few data available on the current topics and characteristics of meta-analyses in dermatology or on the clarity and comprehensiveness of the information they report (4-8). This case study aims to describe the meta-analyses published in the British Journal of Dermatology (BJD) and assess whether the data they contain are reported fully according to the PRISMA Statement.

We conducted a descriptive study of all meta-analyses indexed in PubMed between January 1, 2010, and December 31, 2014. To identify the manuscripts, we used PubMed to search all articles published in the BJD classified by MEDLINE as "meta-analysis." We excluded all trials that did not involve human patients and all secondary analyses of previously published data. Study topics were not mutually exclusive. Two review authors collected the data, resolving any disagreements through discussion. We extracted the following data from each included study: country of origin, number of authors, research topic, funding (yes/no), type of funding, type of population, number and type of databases searched, initial and final number of studies, study type, and number of patients included. In addition, we applied the PRISMA 27-item checklist to all manuscripts.

Twenty-seven meta-analyses were published during the study period. Germany was the main country where the studies were conducted (25.9%). The most common topic was psoriasis (n=11; 40.7%). The mean number of authors was 4.8. Thirteen (48.1%) documents received funding. Only five (18.5%) studies included the pediatric population. The mean number of databases consulted was four. All meta-analyses used the PubMed database; 18 (66.7%) used Cochrane and 17 (63.0%) used Embase. The mean number of included studies in the analyses was 31.1. The main study design was case-control (48.1%), followed by cohort (40.7%) and randomized controlled trials (33.3%) (Table 1).

Most documents completed the 27 items on the PRISMA checklist correctly. In total, 51.9% of the reports were identified as both systematic reviews and meta-analyses and 48.1% as meta-analyses only. A structured summary was provided in 40.7% of cases. All the publications described the rationale in the introduction, and most (85.2%) correctly explained the objectives (including at least four of five sub-items). Regarding methods, only 18.5% of the studies specified a protocol or registration number. Eligibility criteria and information sources were explained in all the documents. Most of the documents fulfilled the criteria listed under search (96.3%), data collection process (88.9%), data items(85.5%), and summary measures (88.9%). In Methods and Results, the publications included the following items in the respectively indicated proportions: study selection (100.0% and 95.3%), risk of bias in individual studies (70.4% and 63.0%), synthesis of results (92.6 and 100.0%), risk of bias across studies (66.7 and 70.4%), and additional analyses (70.4 and 81.5%). All studies described the study characteristics, and 96.3% presented the results of individual studies. The summary of evidence, limitations, and conclusions were provided in all the publications. Similarly, all the documents detailed sources of funding (Table 2).

To sum up, we observed that most of the studies in the BJD correctly recorded the items included in the PRISMA checklist. The meta-analyses mainly concerned psoriasis, which is consistent with a previous study on randomized trials in BJD finding that psoriasis was the main topic (5).

A limitation of our study was that the meta-analyses included were published in a single journal, so the results are not generalizable to all dermatology journals. However, this is a novel study of PRISMA checklist compliance in dermatology meta-analyses,

Table 1. Characteristics of meta-analyses in the British Journal of Dermatology, 2010 to 2014

Study characteristics	no. (%)*
Countries	
Germany	7 (25.9)
UK	6 (22.2)
China	5 (18.5)
Other†	15 (55.5)
Authors: mean (Standard Deviation (SD))	4.8 (2.6)
Topics	
Psoriasis	11 (40.7)
Melanoma	3 (11.1)
Non-melanoma	3 (11.1)
Autoimmune	3 (11.1)
Other‡	7 (26)
Funding	
Any funding	13 (48.1)
One source	6 (22.2)
Two sources	4 (14.8)
Three sources	3 (11.1)
Source of funding (n=13)	
Government	10 (76.9)
Industry	3 (23.1)
Other§	4 (30.8)
Pediatric population	5 (18.5)
Number of databases: mean (SD)	4 (2.1)
Database used	
MEDLINE	27 (100.0)
Cochrane	18 (66.7)
Embase	17 (63.0)
Other databases‖	15 (55.5)
Unpublished data	7 (25.9)
Handsearching	6 (22.2)
Initial number of manuscripts reviewed: mean (SD)	1.449 (1702)
Mean (SD) studies included in the meta-analyses	31.1 (20.6)
Number of patients included: mean (person-years)	685.985 (1,703,382)
Study design	
Case control	13 (48.1)
Cohort	11 (40.7)
RCT	9 (33.3)
Cross sectional	6 (22.2)
Other¶	4 (14.8)

*Unless otherwise indicated

Table 2. Compliance with PRISMA checklist of meta-analyses in the British Journal of Dermatology, 2010 to 2014

PRISMA compliance	no. (%)
Title	27 (100.0)
Title	
Meta-analysis	13(48.1)
Systematic review and meta-analysis	14 (51.9)
Abstract	
Structured summary	11 (40.7)
Introduction	27 (100.0)
Rationale	
Objectives	23 (85.2)
Methods	
Protocol and registration	5 (18.5)
Eligibility criteria	27 (100.0)
Information sources	27 (100.0)
Search	26 (96.3)
Study selection	27 (100.0)
Data collection process	24 (88.9)
Data items	23 (85.5)
Risk of bias in individual studies	19 (70.4)
Summary measures	24 (88.9)
Synthesis of results	25 (92.6)
Risk of bias across studies	18 (66.7)
Additional analyses	19 (70.4)
Results	
Study selection	26 (95.3)
Study characteristics	27 (100.0)
Risk of bias within studies	17 (63.0)
Results of individual studies	26 (96.3)
Synthesis of results	27 (100.0)
Risk of bias across studies	19 (70.4)
Additional analysis	22 (81.5)
Discussion	
Summary of evidence	27 (100.0)
Limitations	27 (100.0)
Conclusions	27 (100.0)
Funding	
Funding	27 (100.0)

†15 documents were published by authors from other countries. Each document may have been published by authors from different countries. 20 documents were published by authors from 1 country, 5 documents from 2 countries, 1 document from 3 countries, and 1 document from 4 countries.

Countries for 3 documents: USA; 2 documents: Australia, Spain, Sweden, the Netherlands; 1 document: Belgium, Canada, Denmark, India, Iran, Italy, Korea, Taiwan.

‡Topics dealt with in 1 document: atopic dermatitis, infectious diseases, skin ageing, surface area, skin conditions, actinic keratosis and toxic epidermal necrolysis

§Sources of funding for 2 documents: private foundation; for 1 document: university and institution.

‖15 documents used other databases. Each document may have used different databases. Databases used for 5 documents: OVID; 4 documents: WOS; 2 documents: Google Scholar, Clinical Trial Register, CINAHL, Wanfang database, China National Knowledge Infrastructure; 1 document: Wiley Online Library, Science Direct, Institute of Scientific Information, Springer, China Bio-medical literature database, Chinese Science and Technology Database, Conference Papers Index, International Pharmaceutical Abstracts, PASCAL, BIOSIS, Chinese Scientific Journals Full Text Database, PsychINFO, LILACS, German S3-psoriasis guidelines.

Study designs for 2 documents: non-randomized controlled trials; 1 document: randomized non-controlled trials, primary studies

and we consider it important to validate and build on these results through larger studies including more journals specializing in dermatology.

Authorship

Conception and design: JMR and IB; Acquisition of data: IP and DRP; Analysis and interpretation of data; IP and JMR; Drafting of article: IP, JMR, DRP, and IB; Final approval of the version to be published: IP, JMR, DRP, and IB.

References

1. Panesar SS, Thakrar R, Athanasiou T, Sheikh A. Comparison of reports of randomized controlled trials and systematic reviews in surgical journals: literature review. J R Soc Med. 2006;99:470-2.
2. Manchikanti L, Benyamin RM, Helm S, Hirsch JA. Evidence-based medicine, systematic reviews, and guidelines in interventional pain management: part 3: systematic reviews and meta-analyses of randomized trials. Pain Physician. 2009;12:35-72.
3. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JP, *et al.* The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. Br J Dermatol. 2009;339:b2700.
4. Williams HC, Dellavalle R. The growth of clinical trials and systematic reviews in informing dermatological patient care. J Invest Dermatol. 2012;132:1008-17.
5. Romero-Pérez D, Ramos JM, Encabo B, Belinchón I. Randomized trials in top dermatological journals, 2008-13. Br J Dermatol. 2016;175:1089-93.
6. Jin Y, Sanger N, Shams I, Luo C, Shahid H, Li G, *et al.* Does the medical literature remain inadequately described despite having reporting guidelines for 21 years? A systematic review of reviews: an update. J Multidiscip Healthc. 2018;11:495-510.
7. Page MJ, Moher D. Evaluations of the uptake and impact of the Preferred Reporting Items for Systematic reviews and Meta-analyses (PRISMA) Statement and extensions: a scoping review. Syst Rev. 2017;6:263.
8. Atakpo P, Vassar M. Publication bias in dermatology systematic reviews and meta-analyses. J Dermatol Sci. 2016;82:69-74.

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