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Assessment of reporting quality in randomised controlled clinical trial abstracts of dental implantology published in the period 2014 – 2016.

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3 **Assessment of reporting quality in randomised controlled clinical trial abstracts**
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5 **of dental implantology published in the period 2014 – 2016**
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10 **Short title:** Reporting Quality in RCT Abstracts of dental implantology
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53 **Word count:** 3821
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58 **Keywords:** quality, abstracts, CONSORT, CONSORT-A
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3 **Objectives:** Access to full texts of randomised controlled clinical trials (RCTs) is often
4 limited, so that the brief summaries of studies play a pivotal role. In 2008 a checklist
5 was provided to ensure transparency and completeness of abstracts. The question is
6 to what extent the CONSORT criteria for abstracts (CONSORT-A) are considered in
7 the preparation of RCT publications thereof.
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15 **Primary Endpoint:** Assessment of means of the percentage share of compliance with
16 the 16 CONSORT-A criteria per study.
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20 **Material and methods:** This study is based on a full survey (212 RCT-abstracts in
21 dental implantology, publication period 2014 – 2016, 45 journals, median impact factor
22 2.328). Apart from merely documenting “adherence” to criteria, the authors also
23 assessed “correct implementation” of requested information where possible. Collection
24 of data was performed independently by two dentists and final consensus. The primary
25 endpoint was evaluated by medians and quartiles. Additionally a Poisson regression
26 was conducted to detect influencing factors.
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37 **Results:** A median of 50% [Q1-Q3: 44%-63%] was documented for the 16 criteria
38 listed in the CONSORT-A statement. Nine of the 16 criteria were considered in less
39 than 50% of abstracts. “Correct implementation” was attested for a median value of
40 43% (Q1-Q3: 31%-50%) of criteria. An additional application of Poisson regression
41 revealed that the number of words used had a locally significant impact on the number
42 of reported CONSORT criteria for abstracts (IRR 1.001, 95%CI 1.001 to 1.002).
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51 **Conclusion:** Transparent and complete reporting in abstracts appears problematic.
52 Limited word count seems to result in a reduction of necessary information. As current
53 scientific knowledge is often not readily available in the form of publications, abstracts
54 constitute the primary basis for decision-making in clinical practice and research. This
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3 is why journals should refrain from limiting the number of words too strictly in order to
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5 facilitate comprehensive reporting in abstracts.
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10 11 **Strengths and limitations of this study**

12 13 14 **1. Literature search**

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16 Our search was performed in one electronic database – PubMed – because it
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18 comprises more than 30 million citations for biomedical literature from MEDLINE and
19
20 is declared the world's largest and most important medical bibliographic database.

21 22 **2. Data extraction**

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24 Two dentists reviewed the abstracts simultaneously and independently from each
25
26 other; the final set of data was drawn up by means of consent.

27 28 **3. Reporting quality by accessing the adherence and correct implementation of the CONSORT statement.**

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30 This approach - for accessing the reporting quality - is new in the field of dental
31
32 implantology; apart from merely documenting “adherence” to criteria, the authors also
33
34 assessed “correct implementation” of requested information.
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37 38 **Funding**

39
40 This research received no specific grant from any funding agency in the public, commercial
41
42 or not-for-profit sectors.
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Assessment of reporting quality in randomised controlled clinical trial abstracts of dental implantology published in the period 2014 – 2016

Background and Objective

Transparent and comprehensive reporting forms the basis for the evaluation and interpretation of published scientific findings. The EQUATOR network currently provides a total of 425 guidelines on reporting in health research to improve the quality of reporting in health care studies,[1].

The CONSORT statement contains recommendations for reporting controlled clinical studies (RCTs) which present the highest evidence level (Ib) and serve as a basis for recommendations and therapy decisions derived therefrom in daily clinical routines as well as evidence-based practice. The CONSORT group has developed guidelines for a variety of study designs, interventions and data and makes checklists available to authors to be used in the preparation of publications,[2]. A specific checklist to generate abstracts has been available since 2008, as this part of a publication plays a key role: researchers and physicians worldwide use information from abstracts of publications in order to assess the relevance and further exploitation of a scientific paper. An abstract, i.e. a publication in miniature format, should therefore convey all necessary information on a scientific study.

A look at the current literature reveals differences between published abstracts in terms of completeness, structure and scope, despite existing and freely available guidelines. Reporting is frequently non-transparent and incomplete, which inevitably leads to two problems:

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1. **Fragmented and incomplete abstract reporting of study results prevents decision-making on therapies in daily clinical routines.**

Due to increasing time constraints in hospitals and a rapidly growing number of published study results, many interested individuals have only time to read the abstracts,[3]. On this basis they need to decide for or against the inspection or acquisition of full texts, and possibly for or against a therapy.

In regions with fewer resources in health care in particular, limited and chargeable access to full texts forces medical staff to make treatment decisions exclusively on the basis of abstracts. This involves a high risk of mistakes with possibly far-reaching consequences for patients.

More specifically, information from study reports on traditional Chinese medicine appears to be available from abstracts exclusively in most cases, since full texts are primarily published in Chinese in this discipline,[4].

2. **Fragmented and incomplete abstract reporting of study results complicates the compilation of evidence-based information in medicine.**

In projects with moderate or no funding in particular, research of the literature is followed by an abstract screening to identify relevant literature and keep costs for the procurement of literature to a minimum. Non-transparent or fragmentary reporting in abstracts entails the risk that relevant study reports will not be considered since presentation of results may be incomplete, incorrect or selective. The effect is especially critical for the drafting of recommendations, where RCT reporting is used for an evidence-based presentation of results. As a consequence of unclear and incomplete reporting the possibility cannot be

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3 excluded that articles of importance to the formulation of therapeutic guidelines
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5 are not identified and therefore not considered.
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9 These problems are widespread in publications from various areas of medical
10 indication,[5-8]. No results have been presented for the field of dental implantology to
11 date; this study therefore aimed to identify the extent to which authors in the field
12 comply with recommendations provided in the CONSORT statement for the
13 compilation of transparent and complete abstracts. The objective was to check RCT
14 publications in dental implantology for information as requested in the CONSORT
15 statement for abstracts.
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28 **Material & Methods**

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30 The authors of this study examined abstracts of published study reports in dental
31 implantology for compliance with 16 criteria recommended by the CONSORT-A,[9].
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33 The objective was to identify the degree – in per cent and per study – to which all
34 criteria requested in CONSORT-A were adhered to (primary endpoint). Secondary
35 research questions served to identify possible factors via regression analysis which
36 might result in a better implementation of CONSORT criteria. These criteria were in
37 addition assessed in terms of their correct and meaningful documentation. Assessment
38 was conducted in two steps: For an assessment of the “degree of adherence I”, the
39 focus was exclusively on the documentation (retrievability) of information in abstracts
40 as requested by CONSORT-A. For an assessment of the degree of adherence II,
41 accuracy and completeness were evaluated. It was only possible to collect this
42 information for 6 out of 16 criteria since an assessment of correctness would not have
43 made sense for the remaining criteria. Assessment of the “degree of adherence II” is
44 based on requirements defined in the CONSORT-A statement,[9] as well as on
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3 information required in “Explanation and Elaboration”,[10]. The latter provides a clear
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5 description of reporting on individual criteria in several subsections. An assessment in
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7 terms of requirements for degree of adherence it was possible for six criteria (see
8
9 supplementary table 1).

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12 A literature search of the publication period 01/2014 to 12/2016 via the search engine
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14 PubMed of the medical database MEDLINE formed the basis for the analysis. For this
15
16 purpose, the keywords “dental implantation”, “dental implant” and “tooth artificial” were
17
18 combined with the logical operator OR. The type of study was restricted to randomised
19
20 and controlled clinical trials (RCTs) (supplementary table 2). Electronic search yielded
21
22 a data pool of 262 reports, 40 abstracts of which had to be excluded after a first
23
24 screening due to a mismatch in disciplines. Ten further abstracts were excluded
25
26 because the publications in question did not report clinical studies. As a result, a total
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28 of 212 abstracts of RCT publications (see Fig. 1) remained as the basis for this study.
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31 The software programme Excel,[11] was used to compile data, and the data mask was
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33 generated on the basis of the CONSORT statement for abstracts,[9]. At the start of the
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35 project, a tool to evaluate abstract quality was available from a preceding study,[6],
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37 which the planners of the study had to slightly adapt and extend for the purposes of
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39 the new area of indication. All 16 CONSORT-A criteria were included in the data
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41 compilation and analysis. General information on each publication was documented to
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43 facilitate a clear classification of reports at a later time, as well as additional data to be
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45 examined for potential impact on reporting quality (year of publication, “structured” or
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47 “unstructured” presentation of abstract, number of patients included, word count and
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49 impact factor of the respective journal). Two dentists reviewed the abstracts
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51 simultaneously and independently from each other. The final set of data was drawn up
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53 by means of consent (JL, CL). Data analysis was performed using the software
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55 programme SPSS Statistics 24 (SK, CB). The authors determined relative frequencies
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3 and interquartile ranges for study-related implementation rates and for the
4
5 implementation of individual criteria. Results at primary endpoint were depicted in the
6
7 form of boxplots. Criteria-related frequencies were illustrated with barcharts,[11].
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12 Possible factors influencing the quality of abstracts were identified by means of an
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14 additional explorative data analysis via Poisson regression (ST). Based on the Akaike
15
16 information criterion (AIC), the aim was to identify the model with the highest predictive
17
18 quality for the incidence of endpoints by means of a Poisson regression with backward
19
20 variable selection. Incidence rate ratios (IRR) including 95% confidence interval and
21
22 respective p-value determined via Wald test were used to describe the influence. Year
23
24 of publication (reference: 2014), presence of a structured abstract (reference: no),
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26 number of patients analysed, impact factor and word count were examined as potential
27
28 influencing factors. The analysis was conducted using the software programme R (R
29
30 Core Team, 2015).
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39 **Patient and Public Involvement:**

40 No patient involved
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44 **Results**

45 **General study characteristics and journals**

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47 The analysis included RCT abstracts from 45 journals (see supplementary table 3) with
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49 a median IF of 2,3280 (min. 0, max. 5,62). The journals “European Journal of
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51 Implantology” (36 of 212 abstracts; 17%) and “Clinical oral implants research” (36 of
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53 212 abstracts; 17%) accounted for about one third. Table 1 shows the general study
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55 characteristics for the data pool evaluated. A major part of information was available
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57 in a structured form (174/212; 82%) with a median of 258 words (min. 94 words,[12]
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and max. 659 words,[13]). The abstracts reported case numbers from published studies between 10,[14-16] and 360,[17]. The median number of study participants was 36.

Study characteristics	Frequencies	
Form of abstract	structured	174 (82%)
	unstructured	38 (18%)
Year of publication	2014	101 (48%)
	2015	74 (35%)
	2016	37 (17%)
Journals	European Journal of Oral Implantology	36 (17%)
	Clinical oral implants research	36 (17%)
	The International journal of oral & maxillofacial implants	23 (11%)
	Clinical implant dentistry and related research	22 (11%)
	other	95 (45%)
Provenance	Europe	70 (33%)
	America	21 (10%)
	Africa	6 (3%)
	Asia	35 (17%)
	Not specified	80 (38%)
Word count (median)	258 [Min. 94; Max. 659]	
Number of cases analysed (median)	36 [Min. 10; Max. 360]	
Impact factor (median)	2,3280 [Min. 0; Max. 5,62]	

Table 1: Study characteristics for 212 RCT abstracts of implantology in terms of frequency [N] and relative frequency (%).

Implementation rate per study

The studies under consideration showed a median implementation of CONSORT-A recommendations (degree of adherence I) of 50% (Q1-Q3 43,8% to 62,5%) per abstract, whereby eight out of 16 criteria were documented (min. 7, max. 14 criteria); see also supplementary figure 1. The criterion with the highest percentage of documentation was “intervention” (100%). A documentation of less than 10 % was found for “trial registration” and “funding” (see Table 2).

CONSORT criterion	Implementation N (%) Degree of adherence I	Implementation N (%) Degree of adherence II
Identification as a randomised trial in the title	95 (45)	95 (45)*
Trial design	66 (31)	66 (31) *
Participant characteristics	154 (73)	154 (73) *
Interventions	212 (100)	200 (94)
Objective	209 (99)	209 (99) *
Definition primary endpoint	198 (93)	117 (55)
Randomisation	35 (17)	13 (6)
Blinding	41 (19)	21 (10)
Numbers randomised	97 (46)	97 (46) *
Recruitment	196 (93)	196 (93) *
Numbers analysed	57 (27)	57 (27)*
Results of Outcome	207 (98)	133 (63)
Harms	23 (11)	23 (11) *
Conclusion	204 (96)	47 (22)
Trial Registration	10 (5)	10 (5) *
Funding	8 (4)	8 (4) *
Total		

Table 2: Implementation N [%] of CONSORT criteria for abstracts in 212 reports of published RCTs in the field of implantology. Presentation of degree of adherence I (information given in the abstract) and degree of adherence II (correct documentation in accordance with CONSORT-A). * Variables without formal degree of adherence II.

In terms of correct implementation (degree of adherence II), a median implementation of 40,6% (6.5 criteria) was found with an interquartile range of 31,3% to 50,0%. One abstract,[18] revealed the lowest implementation with only the criterion “Objective” (6,25%), whereas Esposito et al., 2014 documented a maximum number of 13 criteria (81,25%).

For the criteria “randomisation” (documentation 17%, correct implementation 6%) and “conclusion” (documentation 96%, correct implementation 22%), the authors found a decrease of $\geq 50\%$ in the implementation rate from degree of adherence I to degree of adherence II (see Table 2).

Implementation rates per criterion

General criteria

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3 From 212 abstracts under consideration, 45% mentioned RCT as study design in the
4 title of the study (95/212). 31% gave a more detailed description of the study design
5 such as parallel group study, blinded study, placebo-controlled study (66/212).
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10 11 12 *Methods*

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14 The “aim of the study” was documented in 99% of examined abstracts (209/212).
15 Information on “primary endpoint” was given in 93% (198/212); this information was,
16 however, clearly defined in only 55% (117/212), including specification of the
17 measurement variable. “Eligibility criteria für participants and the settings“ were found
18 in 73% (154/212) of abstracts, and a complete documentation of the “intervention for
19 each group” in all 212 abstracts (100%). 94% (200/212) reported an exact
20 dose/therapy for each intervention group. Random allocation of participants to the
21 intervention group was documented in 17% (35/212) of cases; only 6% (13/212) of
22 abstracts contained data on generation of the random sequence and on
23 implementation. 19% (41/212) of abstracts mentioned blinding prior to the study; 10%
24 (21/212) indicated the blinded groups of participants.
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42 *Results*

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44 In terms of result presentation, 93% (196/212) of abstracts provided information on the
45 current status of the study (study completed, interim analysis after xy years). The
46 number of randomised participants was given in 46% (97/212) of abstracts, and of
47 analysed participants in 27% (57/212). 98% (207/212) of abstracts under consideration
48 reported results at the primary endpoint; but only 63% (133/212) of abstracts contained
49 a precise effect size. 11% (23/212) of examined RCT abstracts documented major
50 (significant) harms. 96% (204/212) provided a general summary of results; only 22%
51 (47/212), however, described the strengths and deficits of the respective study.
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3 Registration was documented in 5% (10/212) of abstracts, and information on funding
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5 in 4% (8/212).
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10 The additional explorative analysis by means of Poisson regression included 199 out
11 of 212 abstracts, since 13 abstracts did not provide information on all potential
12 influencing factors. For both degrees of adherence – I and II – the number of words
13 used was shown to have a locally significant impact on the number of reported
14 CONSORT abstract criteria (degree of adherence I: IRR 1.001, 95% CI 1.001 to 1.002;
15 degree of adherence II: IRR 1.002, 95%CI 1.001 to 1.003). The percentage of
16 explained variance according to Nagelkerke R^2 was 14% and 21% respectively. The
17 other possible influencing variables – year of publication, presence of a structured
18 abstract, number of patients included and impact factor – were not selected in the
19 the backward variable selection via AIC and had no significant influence on the number
20 of reported CONSORT-A criteria.
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38 Discussion

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40 This study examined the degree to which recommendations of the CONSORT
41 statement for abstracts were implemented in trial publications on dental implantology.
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43 212 abstracts from the period 2014 to 2016 showed a median documentation of the
44 required criteria (degree of adherence I) of 50%. With the focus on a “correct”
45 compliance with the requirements of the statement (in this context: degree of
46 adherence II), adherence declined to 40,6% (see Fig. 2 and Table 2).
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56 A comparison of all criteria revealed that the two criteria “funding” and “trial registration”
57 in particular were documented rarely (5% and 4% respectively). In general, journal
58 editors request these details separately, and they are mentioned in the publication but
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3 not in the abstract. In addition, the content of abstracts is often massively reduced by
4 word count limitations requested by the publishers. A poisson regression analysis
5 conducted for the purposes of this study showed that word count limits were
6 responsible for lesser reporting quality or missing details in abstracts (IRR 1.001, 95%
7 CI 1.001 to 1.002). The influence of the number of words used in the abstract had
8 already been documented in a previous study by Baulig et al. (N=136) (Poisson
9 regression based IRR 1.002, 95% CI 1.001 to 1.003). This previous study explored the
10 abstract quality in ophthalmology RCTs for the indication of age-related macular
11 degeneration. The analysis revealed a median implementation of seven criteria (95%
12 CI 7 to 8),[6]. Results are similar to those found in the present study in the field of
13 dental implantology.

14
15 Notwithstanding any word count limitations, minor additional information (such as
16 registration ID, identification as RCT in the title, specification of patient numbers at
17 randomisation or analysis) can be included in the text (e.g. numbers in brackets)
18 without need for considerably more words. Such inclusions provide important
19 information on indexing or for the benefit of readers and improve the transparency
20 required for abstracts. A publication by Berwanger et al.,[19] offers an excellent
21 template for transparent and comprehensive reporting in abstracts even if the word
22 count has been restricted.

23
24 Assessment of the documentation of CONSORT-A criteria in this paper is based on
25 abstracts exclusively. Original texts (full texts) or information provided outside the
26 abstract text were not explored and not taken into consideration. Since the two criteria
27 “funding” and “trial registration” need not necessarily be placed in the abstract and a
28 subjective presentation of the implementation ratio might be the consequence, to the
29 detriment of the authors’ duty of documentation, an additional evaluation of data on the
30 basis of only 14 criteria seemed advisable, to the exclusion of “funding” and “trial

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3 registration". This further evaluation yielded a somewhat higher "implementation ratio"
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5 for degree of adherence I of 57,1% with an interquartile range of 50,5% to 71,4% (see
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7 supplementary Fig. 2). For degree of adherence II, the authors found a still reduced
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9 implementation ratio of 42,9% (Q1-Q3; 35,7% - 57,1%). A median of eight criteria
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11 (interquartile range 7-10 criteria) was documented, and six criteria were correctly
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13 implemented (interquartile range 5-8 criteria). It was, however, obvious from both data
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15 pools (14 vs. 16 criteria) that a far smaller number of CONSORT-A criteria was
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17 identified as fulfilled if correct implementation was explored in addition to mere
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19 documentation (see supplementary Fig. 3).
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26 An analysis of data for 14 CONSORT-A criteria by means of Poisson regression also
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28 revealed a locally significant influence of the abstract word count on the quality of
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30 abstracts (degree of adherence I: IRR 1.001, 95% CI 1.001 to 1.002, $p < 0,001$; degree
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32 of adherence II: IRR 1.002, 95% CI 1.001 to 1.003, $p < 0,001$). The percentage of
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34 explained variance according to Nagelkerke R^2 was 13% and 20% respectively. Other
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36 possible influencing variables, i.e. year of publication, presence of a structured
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38 abstract, number of patients included and impact factor, were again not selected in the
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40 backward selection via AIC and had no significant influence on the number of
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42 CONSORT-A criteria reported in the abstracts under consideration.
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49 Findings from a doctoral project were presented in the context of the study; the project
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51 in question did not receive any financial support or assistance. Literature search was
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53 therefore exclusively conducted by means of the internet based literature database
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55 PubMed with a total of over 30 million quotations for biomedical literature from
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57 MEDLINE, Life-Science journals and online books which was directly available free of
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59 charge to all researchers involved. When interpreting the findings of this study, readers
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3 should therefore be aware that inclusion of further databases might lead to a bias of
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5 results.
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8 In order to minimise bias on the part of evaluators, two researchers/physicians
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10 performed the analysis in parallel and independently from each other. Abstract
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12 evaluation was based on .txt files which were generated directly in PubMed after
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14 completed search operation. This strategy ensured that all abstracts were available in
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16 the same visual form, and ruled out any influence due to the graphic presentation of
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18 abstracts. However, evaluators were not blinded with respect to journals, authors and
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20 publication periods, so that a possible assessor bias can be assumed.
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26 The calculation of Cohen's Kappa shows a high conformity between both assessors
27
28 for eight out of 16 criteria (see supplementary table 4). With a focus on the percentage
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30 of correlation, the lowest degree of conformity between assessors was identified for
31
32 the criterion "harms" (62%; $\kappa=0,041$). Information on this aspect may possibly be more
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34 or less deduced from the abstract (if one reads between the lines), and is not always
35
36 explicitly presented as health disadvantages for patients. An evaluation of abstract
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38 quality performed in a previous study in the field of ophthalmology (Baulig et al., 2018)
39
40 served as a basis for the present study in terms of assessment tool, evaluation
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42 procedure and evaluation, so that no study protocol was deemed necessary for the
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44 present study.
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51 Several publications from other areas of indication with similar research questions
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53 confirmed our results for the general implementation of criteria. Gallo et al. analysed
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55 126 abstracts from the period 2011 to 2018 for the rate of implication. The authors
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57 found that in general seven criteria (SD ± 2) were considered per publication. "Trial
58
59 registration", "method of randomisation" and "source of trial funding" were documented
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3 with a frequency of less than 5%,[20]. Chow et al. report on the adherence to
4 CONSORT criteria in 395 abstracts in the field of anaesthesiology. Their study
5 documented that 75% of these abstracts from RCTs published in 2016 met less than
6 half of the 16 criteria. In line with the present study, their examination revealed that not
7 a single one of the publications included took all 16 CONSORT criteria for abstracts
8 into consideration. An implication rate of < 50% was found for the following criteria:
9 “designation in the title”, “study design”, “baseline data”, “objective”, “randomisation”,
10 “blinding” “number of randomised participants”, “outcome”, “registration” and
11 “funding”,[21]. Speich et al. explored the abstract quality in published study reports
12 from the field of surgery (2014 – 2016),[22]. They found a general implementation of
13 eight criteria (95%- KI 7.83 - 8.39), whereby “randomisation”, “blinding” and “funding”
14 were considered in less than 20%.

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33 The above-mentioned reports are consistent with the present study, in terms of the low
34 number of criteria met as well as of those criteria for which the lowest degree of
35 adherence was found. The authors criticise in particular the documentation of
36 “randomisation”, “blinding”, and “number of randomised/analysed participants”. The
37 section “Explorations & Elaborations” describes in detail in which way the 16 required
38 CONSORT-A criteria contribute to the completeness and sufficient transparency of an
39 abstract, whereby the relevance of individual criteria and their processing is not under
40 discussion in this context. The literature gives no clues as to a possibly bigger or
41 smaller impact of criteria on reporting quality. However, further studies should consider
42 a weighting of required criteria, with the possible consequence that future studies can
43 present the degree of implementation in a more objective manner.

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Apart from poor documentation of the criteria “blinding”, “randomisation” and “harms,”
our study revealed additional massive deficits in the documentation of “definition of

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3 primary endpoint”, “results/outcomes” and “conclusion” (see Table 2 and Fig. 3). In the
4
5 evaluation of “accuracy”, the degree of adherence declined by at least 30%, since the
6
7 pertinent information was documented in the abstract but not in the manner required
8
9 by CONSORT-A. Deficits in the implementation of CONSORT-A recommendations
10
11 therefore tend to occur more frequently with methodological criteria, as was confirmed
12
13 by Ghimire et al. This research team reports a documentation of randomisation
14
15 (“Allocation Concealment”) in only 12% of abstracts, and of blinding in only 21%,^[23].
16
17 Obviously there are criteria which authors adhere to in general, and a few others
18
19 (statistical criteria) that are reported infrequently. It can be assumed that a large
20
21 number of individuals is involved in the compilation of an abstract (publication), so that
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23 different text sections are inevitably drawn up with different prerequisites and quality
24
25 requirements (transparency and completeness). This may explain deficits in specific
26
27 areas. Deficits in the statistical aspects in particular might be reduced by involving
28
29 medical statisticians / biometricians in the compilation of publications and also in the
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31 review process.
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40 Currently, 585 journals refer authors to the CONSORT statement,^[24]; nevertheless,
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42 there is an urgent need to improve abstracts. Findings from this study suggest that not
43
44 all authors pay attention to the CONSORT statement as recommended by journals.
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46 The statement for abstracts and the corresponding checklist as well as the interactive
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48 exploration platform provided in this context (CONSORT, 2019b; Hopewell et al.,
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50 2008b) appear to be inadequate to ensure transparent and comprehensive reporting
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52 even though they contain exact and detailed instructions for implementation as well as
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54 specific examples. A particularly worrying fact is that the low rate of implementation
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56 was also found for criteria which are easy to meet, such as the identification of a
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58 publication as RCT in the title, documentation of registration ID, or number of
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3 participants included in the analysis. It seems reasonable to assume that
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5 recommendations for the publication standard were not implemented because the
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7 authors would have to study additional literature for this purpose, and might not have
8
9 the time or patience to do so. A large part of journals supports the idea to explicitly
10
11 request authors to use the CONSORT checklist; CONSORT is endorsed by over 50%
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13 of the core medical journals listed in the *Abridged Index Medicus* on PubMed as per
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15 April 2020,[25]. A general request to adhere to the CONSORT-A checklist in the
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17 drafting of publications and a demand for obligatory implementation on the part of all
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19 journals may further improve reporting quality in abstracts and thus promote
20
21 comprehensive and transparent presentation. Moreover, reviewers should check data
22
23 for completeness and accuracy. Bearing in mind that publications are reviewed under
24
25 increasing time pressure and primarily outside the job and on an honorary basis, the
26
27 entire review system might have to be reconsidered. One option would be to check
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29 abstracts/publications for completeness of reporting as a preliminary step, followed by
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31 the actual review procedure.
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40 **Conclusion**

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42 Even though the CONSORT group gave recommendations for the compilation of
43
44 abstracts as early as in 2008, the quality of such “mini publications” remained
45
46 suboptimal. Co-authors well versed in statistics should address and/or check
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48 methodological criteria in particular in the drafting of abstracts and in the review
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50 process. Word count limitation seems to be another reason for the reduction of
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52 important information. Abstracts play a key role for readers, and journals should not
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54 restrict the admissible number of words too rigidly.
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3 **Authors' contributions:** Stephanie Knippschild wrote the initial draft of this
4 manuscript and performed major parts of the statistical analysis. Jeremias
5 Loddenkemper screened all abstracts of the literature search through PubMed and
6 documented suitable publications for further processing. Moreover, he extracted the
7 necessary information for evaluating the abstract quality and performed data entry and
8 data validation. Sabrina Tulka performed the regression analysis and revised the initial
9 draft of this manuscript. Christine Loddenkemper conducted the validation of the pool
10 of studies by screening all abstracts and evaluating the studies included. Christine
11 Baulig designed the meta-investigation and its analysis concept; she implemented the
12 literature search including the identification of those RCTs to be included in the meta-
13 analysis and thoroughly revised the initial draft of this manuscript.
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31 **Acknowledgement**

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34 The authors thank Christina Wagner for linguistic support in the preparation of this
35 manuscript.
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40 **Competing interests**

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42
43 This study is part of the doctoral thesis written by Mr. Jeremias Loddenkemper in pursuit of a
44 doctoral degree in dental medicine ("Dr. med. dent.") at Witten/Herdecke University.
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48 Furthermore, the results contained in this article have already been presented by means of
49 an poster presentation at 33. Kongress of the DGI, Hamburg (November 28.-30. 2019)
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52 **Non-financial competing interests**

Literaturverzeichnis

1. EQUATOR-Network. EQUATOR-Network: Minervation Ltd; [Available from: <https://www.equator-network.org/reporting-guidelines/>].
2. CONSORT. Extensions of the CONSORT Statement 2019 [Available from: <http://www.consort-statement.org/extensions>].
3. Barry HC, Ebell MH, Shaughnessy AF, et al. Family physicians' use of medical abstracts to guide decision making: style or substance? *J Am Board Fam Pract* 2001;14:437-42.
4. Wang L, Li Y, Li J, et al. Quality of reporting of trial abstracts needs to be improved: using the CONSORT for abstracts to assess the four leading Chinese medical journals of traditional Chinese medicine. *Trials* 2010;11:75.
5. Alharbi F, Almuzian M. The quality of reporting RCT abstracts in four major orthodontics journals for the period 2012-2017. *J Orthod* 2019;46:225-34.
6. Baulig C, Krummenauer F, Geis B, et al. Reporting quality of randomised controlled trial abstracts on age-related macular degeneration health care: a cross-sectional quantification of the adherence to CONSORT abstract reporting recommendations. *BMJ Open* 2018;8:e021912.
7. Khan MS, Shaikh A, Ochani RK, et al. Assessing the Quality of Abstracts in Randomized Controlled Trials Published in High Impact Cardiovascular Journals. *Circ Cardiovasc Qual Outcomes* 2019;12:e005260.
8. Kuriyama A, Takahashi N, Nakayama T. Reporting of critical care trial abstracts: a comparison before and after the announcement of CONSORT guideline for abstracts. *Trials* 2017;18:32.
9. Hopewell S, Clarke M, Moher D, et al. CONSORT for reporting randomised trials in journal and conference abstracts. *Lancet* 2008;371:281-3.
10. Hopewell S, Clarke M, Moher D, et al. CONSORT for reporting randomized controlled trials in journal and conference abstracts: explanation and elaboration. *PLoS Med* 2008;5:e20.
11. Excel®. Microsoft® Excel® 2010. Redmond WA USA Microsoft Corporation. ; 2010.
12. De Angelis N, Nevins ML, Camelo MC, et al. Platform switching versus conventional technique: a randomized controlled clinical trial. *The International journal of periodontics & restorative dentistry* 2014;34 Suppl 3:s75-9.
13. Pistilli R, Felice P, Piatelli M, et al. Blocks of autogenous bone versus xenografts for the rehabilitation of atrophic jaws with dental implants: preliminary data from a pilot randomised controlled trial. *European journal of oral implantology* 2014;7:153-71.
14. Gocmen G, Atali O, Aktop S, et al. Hyaluronic Acid Versus Ultrasonic Resorbable Pin Fixation for Space Maintenance in Non-Grafted Sinus Lifting. *Journal of oral and maxillofacial surgery : official journal of the American Association of Oral and Maxillofacial Surgeons* 2016;74:497-504.
15. Kasperski J, Rosak P, Roj R, et al. The influence of low-frequency variable magnetic fields in reducing pain experience after dental implant treatment. *Acta Bioeng Biomech* 2015;17:97-105.
16. Torroella-Saura G, Mareque-Bueno J, Cabratosa-Termes J, et al. Effect of implant design in immediate loading. A randomized, controlled, split-mouth, prospective clinical trial. *Clinical oral implants research* 2015;26:240-4.
17. Arduino PG, Tirone F, Schiorlin E, et al. Single preoperative dose of prophylactic amoxicillin versus a 2-day postoperative course in dental implant surgery: A two-centre randomised controlled trial. *European journal of oral implantology* 2015;8:143-9.
18. Arbab H, Greenwell H, Hill M, et al. Ridge Preservation Comparing a Nonresorbable PTFE Membrane to a Resorbable Collagen Membrane: A Clinical and Histologic Study in Humans. *Implant dentistry* 2016;25:128-34.
19. Berwanger O, Ribeiro RA, Finkelsztejn A, et al. The quality of reporting of trial abstracts is suboptimal: survey of major general medical journals. *J Clin Epidemiol* 2009;62:387-92.
20. Gallo L, Wakeham S, Dunn E, et al. The Reporting Quality of Randomized Controlled Trial Abstracts in Plastic Surgery. *Aesthet Surg J* 2020;40:335-41.

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3 21. Chow JTY, Turkstra TP, Yim E, et al. The degree of adherence to CONSORT reporting guidelines
4 for the abstracts of randomised clinical trials published in anaesthesia journals: A cross-sectional study
5 of reporting adherence in 2010 and 2016. *Eur J Anaesthesiol* 2018;942-8.
6
7 22. Speich B, Mc Cord KA, Agarwal A, et al. Reporting Quality of Journal Abstracts for Surgical
8 Randomized Controlled Trials Before and After the Implementation of the CONSORT Extension for
9 Abstracts. *World J Surg* 2019;2371-8.
10
11 23. Ghimire S, Kyung E, Kang W, et al. Assessment of adherence to the CONSORT statement for
12 quality of reports on randomized controlled trial abstracts from four high-impact general medical
13 journals. *Trials* 2012;13:77.
14
15 24. CONSORT. Endorsers - Journals and Organizations: CONSORT; 2019 [Available from:
16 <http://www.consort-statement.org/about-consort/endorsers1>.
17
18 25. Group TC. Endorsers-Journals and Organizations 2020 [Available from: [http://www.consort-](http://www.consort-statement.org/about-consort/endorsers1)
19 [statement.org/about-consort/endorsers1](http://www.consort-statement.org/about-consort/endorsers1).
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3 **Fig. 1:** Description of the selection procedure and documentation of the number of
4 published RCTs from dental implantology, the aim being a data pool to identify – per
5 criterion and study – the degree of adherence to the CONSORT recommendations for
6 abstracts. 50 study reports had to be excluded from further investigation and analysis
7 because the field of indication (N=1) or the study design (N=39) were not compatible,
8 or the respective datasets referred to investigations of animals (N=7), were reviews
9 (N=1) or not identifiable as RCTs (N=2).

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21 **Fig. 2:** Illustration of degree of adherence per study (%) via box plot (N=212). Degree
22 of adherence I (quantitative implementation), degree of adherence II (qualitative
23 implementation).

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31 **Fig. 3:** Graphic display of proportional implementation of criteria to facilitate the location
32 of pertinent information in the abstract (degree of adherence I vs. degree of adherence
33 II).

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40 **Supplementary Fig. 1:** Graphic display of proportional implementation of criteria to
41 facilitate the location of pertinent information in the abstract (degree of adherence I).

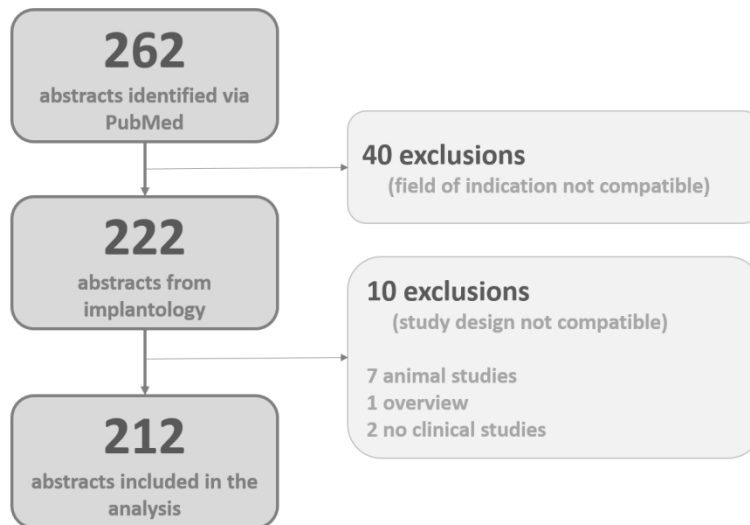
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47 **Supplementary Fig. 2:** Illustration of degree of adherence per study (%) via box plot
48 (N=212). Degree of adherence I (quantitative implementation), degree of adherence
49 II (qualitative implementation). Evaluation of reduced datapool with 14 criteria
50 (excluded: “registration” and “funding”).

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58 **Supplementary Fig. 3:** Illustration of degree of adherence per study (%) via box plot
59 (N=212) as comparison of datapools with 14 vs. 16 criteria. Degree of adherence I
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3 (quantitative implementation), degree of adherence II (qualitative implementation).
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5 Evaluation of reduced datapool was based on 14 criteria (excluded: “registration” and
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7 “funding”).
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For peer review only



Description of the selection procedure and documentation of the number of published RCTs from dental implantology, the aim being a data pool to identify – per criterion and study – the degree of adherence to the CONSORT recommendations for abstracts. 50 study reports had to be excluded from further investigation and analysis because the field of indication (N=1) or the study design (N=39) were not compatible, or the respective datasets referred to investigations of animals (N=7), were reviews (N=1) or not identifiable as RCTs (N=2).

283x182mm (150 x 150 DPI)

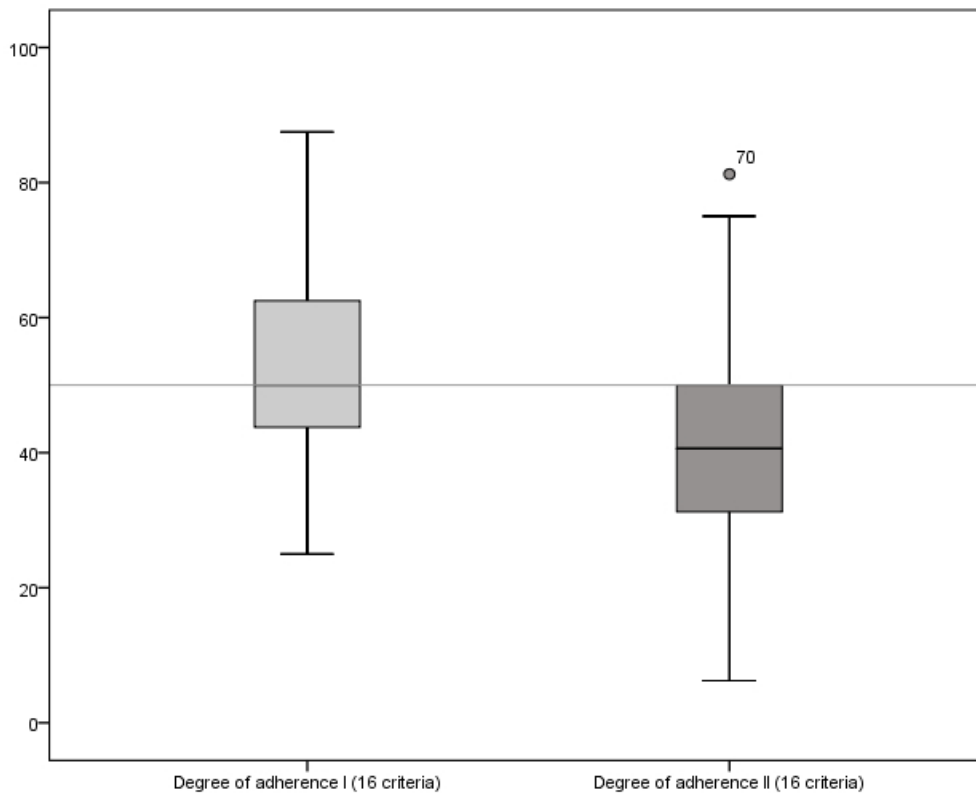
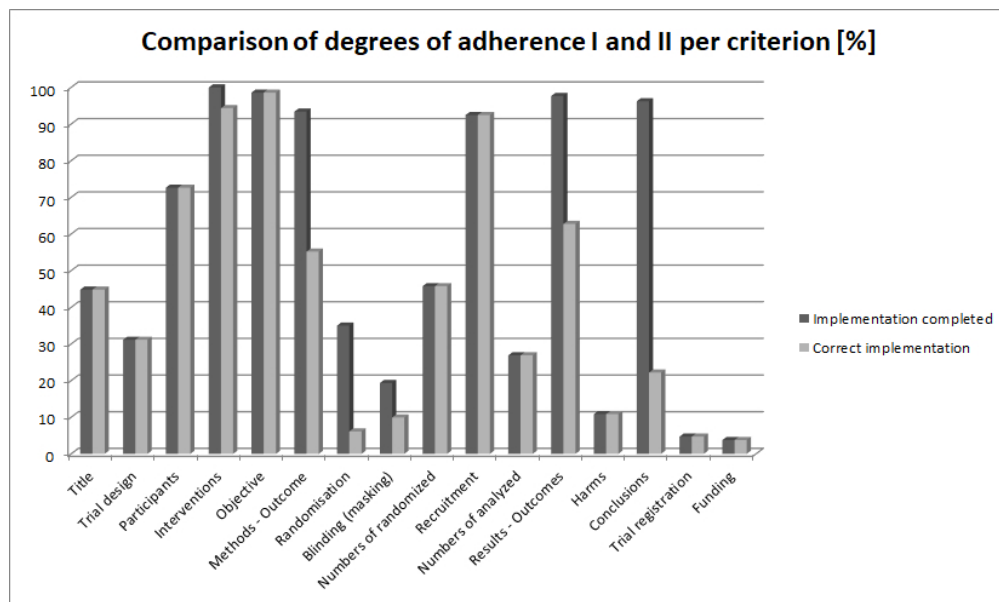


Illustration of degree of adherence per study (%) via box plot (N=212). Degree of adherence I (quantitative implementation), degree of adherence II (qualitative implementation).

220x176mm (72 x 72 DPI)



Graphic display of proportional implementation of criteria to facilitate the location of pertinent information in the abstract (degree of adherence I vs. degree of adherence II).

69x41mm (300 x 300 DPI)

CONSORT criterion	Degree of adherence I	Degree of adherence II
Identification as a randomised trial in the title	Does the title contain "randomised controlled trial" or RCT?	*
Trial design	Description of design in addition to: RCT (randomised, controlled) and Multicentre...	*
Participant characteristics	To document patient characteristics in the abstract, it is not enough to say that patients are suitable for the therapy.	*
Interventions	Intervention indicated	Intervention for each group including dosis indicated
Objective	Specific objective or hypothesis	*
Definition primary endpoint	Documentation of (multiple) endpoints	Clearly defined primary endpoint including measurement variables
Randomisation	Documentation of randomisation ratio in the section Material and Methods	Description of method used to generate the random allocation sequence and implementation in the section Material and Methods
Blinding	Documentation of "blinded" procedure using "masked", "blinded", "doubleblind" or similar descriptions	Exact indication of which patient group was blinded
Numbers randomised	Number of patients randomised to each group must be given, or at least total number with randomisation ratio!	*
Recruitment	Dates defining the trial period (trial completed/interim report/trial from ... to ...).	*
Numbers analysed	Number of participants analysed in EACH group	*
Results of outcome	Results reported in section "Results"	Results were reported with reference to the primary endpoint. Effect size and precision are reported for each group.
Harms	General description	*
Conclusion	The abstract contains a conclusion or summary.	The conclusion refers to the research question/results and lists benefits and limitations of the study
Trial registration	Registration number	*
Funding	Source of funding	*

Supplementary table 1: Evaluation basis for CONSORT-A criteria referring to degree of adherence I (information given in the abstract) and degree of adherence II (correct documentation in accordance

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3 with CONSORT-A). * Variables without formal degree of adherence II. Values from degree of adherence
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Search	MESH Therms	No. of studies
#8	Search (((("randomized controlled trial"[Publication Type]) AND ("2014"[Date - Publication] : "2016"[Date - Publication])) AND human) AND (((dental implantation) OR dental implant) OR tooth artificial)	262
#7	((dental implantation) OR dental implant) OR tooth artificial	46684
#6	Search dental implantation	21511
#4	Search human	16842581
#2	Search ("2014"[Date - Publication] : "2016"[Date - Publication])	3387284
#1	Search "randomized controlled trial"[Publication Type]	429525

Supplementary table 2: Result from literature research in the electronic database PubMed on March 7, 2017

Journal <i>[journal title abbreviation]</i>	Number <i>[N]</i>	Proportion <i>(%)</i>	5-year IF <i>[as per 2018]</i>	Word count limits <i>[words]</i>
Acta Bioeng Biomech	1	0,5	1,112	150-250
Acta Odontol Scand	3	1,4	1,565	250
Am J Dent	1	0,5	0,720	No limit
Am J Orthod Dentofacial Orthop	2	0,9	1,911	250
Angle Orthod	1	0,5	1,880	250
Ann Anat	2	0,9	2,241	No limit
Biomed Res Int	3	1,4	2,197	300
Br J Oral Maxillofac Surg	2	0,9	1,164	250
Clin Implant Dent Relat Res	22	10,4	3,212	150-200
Clin Oral Implants Res	36	17,0	3,825	250
Compend Contin Educ Dent	1	0,5	0	n.a.
Curr Med Res Opin	1	0,5	2,345	250
Eur J Oral Implantol	36	17,0	2,513	250
Eur J Orthod	1	0,5	1,841	330
Hua Xi Kou Qiang Yi Xue Za Zhi	2	0,9	0	No limit
Int J Oral Maxillofac Surg	7	3,3	1,961	300
Int J Oral Maxillofac Implants	23	10,8	1,734	350
Int J Periodontics Restorative Dent	7	3,3	1,228	75-100
Int J Prosthodont	7	3,3	1,533	350
Implant Dent	5	2,4	1,214	225
J Biomater Appl	1	0,5	2,442	No limit
J Bone Miner Res	1	0,5	5,711	300
J Clin Periodontol	9	4,2	4,164	200
J Craniofac Surg	1	0,5	0,785	200
J Dent	1	0,5	3,280	250
J Dent Res	4	1,9	5,125	300
J Oral Implantol	3	1,4	5,125	250
J Oral Maxillofac Surg	1	0,5	1,781	300
J Oral Rehabil	3	1,4	2,341	250
J Periodontol	4	1,9	2,768	250
J Periodontal Res	1	0,5	2,613	250
J Plast Reconstr Aesthet Surg	1	0,5	2,228	250
J Prosthodont	2	0,9	2,636	350
Med Oral Patol Oral Cir Bucal	3	1,4	1,284	150-300
Oral Maxillofac Surg	1	0,5	1,781	300
Oxid Med Cell Longev	1	0,5	4,868	200
Prog Orthod	1	0,5	1,381	350
Quintessence Int	1	0,5	1,392	250
Saudi Med J	2	0,9	1,055	230
Sci Rep	1	0,5	4,011	200
Stomatologiia	1	0,5	0	250
Swed Dent J	1	0,5	0,818	300

Trials	3	1,4	1,975	350
Vestn Ross Akad Med Nauk	1	0,5	0	300-500
Vojnosanit Pregl	1	0,5	0,272	450
Total	212	100,0		

Supplementary table 3: List of journals [N] (%) from which information was extracted for final analysis, 5-year Impact Factor [2018] and word count limits for each journal as per 2019

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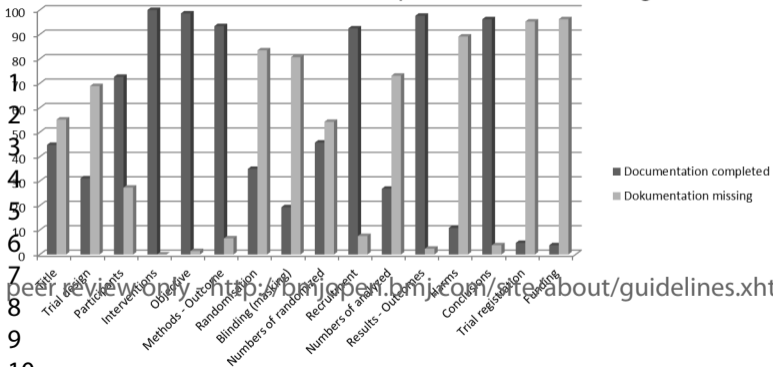
Criterion	Percentage match	Kappa	*Kappa 0.61 – 1.0 (essential match and almost perfect match)
Title	83%	0,677	*
Trial design	89%	0,738	*
Participants	90%	0,744	*
Interventions	100%	n.a.	
Objective	100%	0,798	*
Outcome	91%	0,312	
Randomisation	82%	0,318	
Blinding (masking)	92%	0,726	*
Numbers randomised	76%	0,515	
Recruitment	85%	0,310	
Numbers analysed	84%	0,606	
Outcome	100%	1,000	*
Harms	62%	0,041	
Conclusions	100%	1,000	*
Trial registration	97%	0,449	
Funding	99%	0,762	*

Supplementary table 4: Calculation of Kappa for inter-rater reliability; percentage match between evaluators; Kappa, n.a.= in this case calculation of Kappa was not performed (SPSS) since one evaluator had rated the criterion "intervention" as 1 for all publications; (*) for criteria which showed an essential match or an almost perfect match between evaluators.

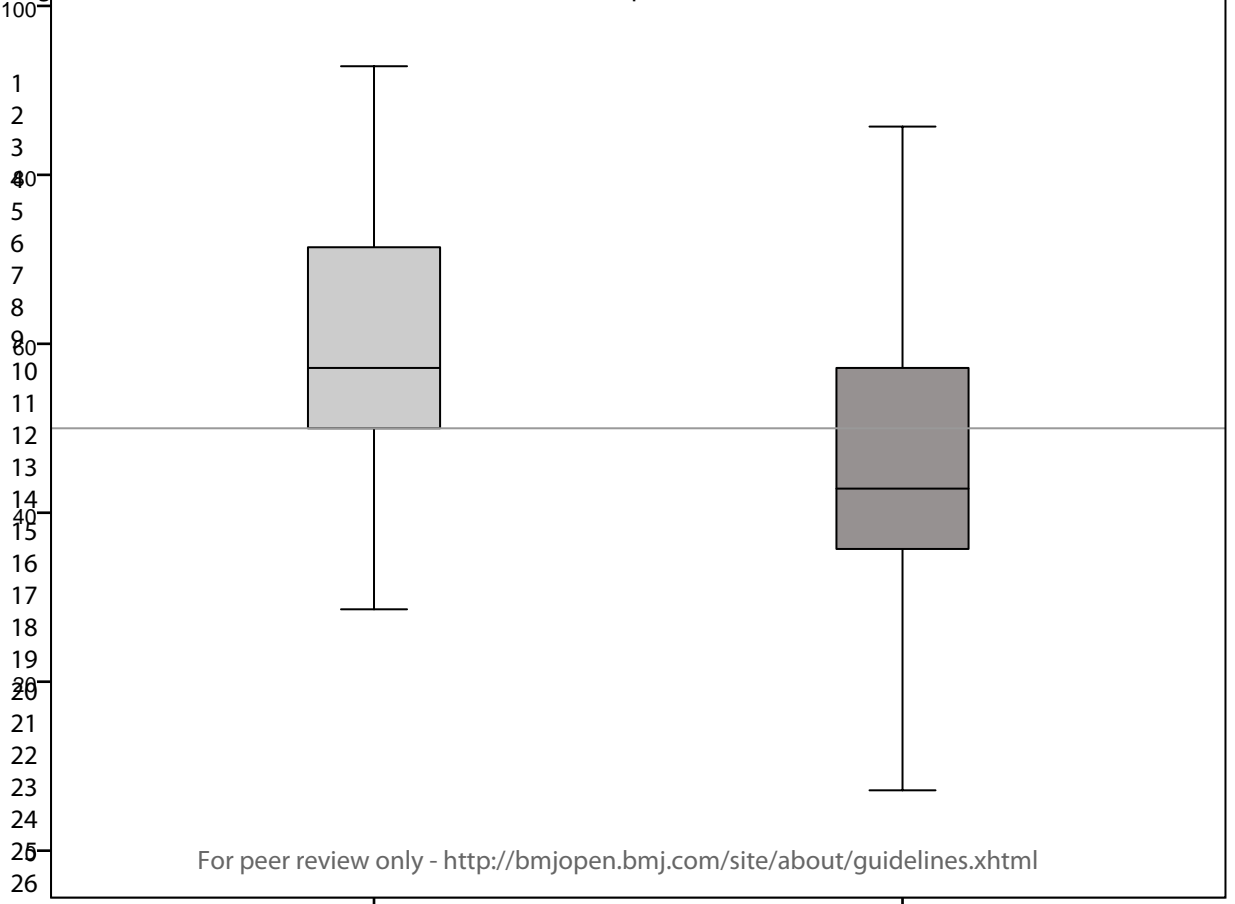
Degree of adherence per criterion - degree of adherence I [%]

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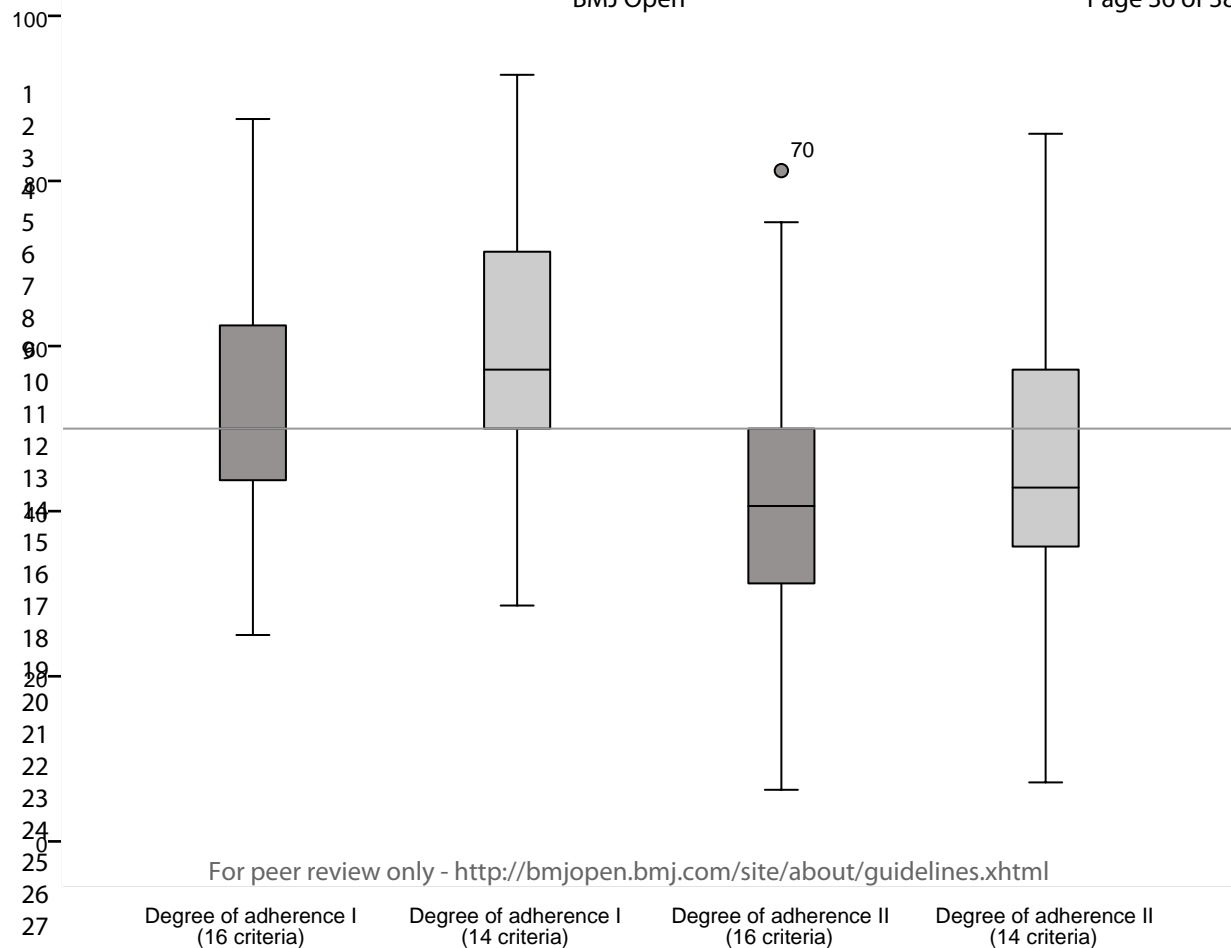
Peer review only <http://bmjopen.bmj.com/site/about/guidelines.xhtml>



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Degree of adherence I (14 criteria)

Degree of adherence II (14 criteria)





PRISMA 2009 Checklist

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Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	II
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	1-3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	n.a.
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4-5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Supplementary table 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4 Figure 1
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	4
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	3-4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	n.a. -> Assessment of Abstracts
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	4-5



PRISMA 2009 Checklist

Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	n.a.
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Page 1 of 2

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	n.a. -> Assessment of Abstracts
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	5
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Table 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	5-6
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	n.a. -> Assessment of Abstracts
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	n.a. -> Assessment of Abstracts
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	n.a. -> Assessment of Abstracts
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	n.a. -> Assessment of Abstracts
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	8-9
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	12-14
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	11-12
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	15



PRISMA 2009 Checklist

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FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	III 11

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: www.prisma-statement.org.

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Assessment of reporting quality in randomized controlled clinical trial abstracts of dental implantology published from 2014 – 2016

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2020-045372.R1
Article Type:	Original research
Date Submitted by the Author:	18-Mar-2021
Complete List of Authors:	Knippschild, Stephanie; University Witten Herdecke Faculty of Health, Institute for Medical Biometry and Epidemiology Loddenkemper, Jeremias; University Witten Herdecke Faculty of Health, Institute for Medical Biometry and Epidemiology Tulka, Sabrina; University Witten Herdecke Faculty of Health, Institute for Medical Biometry and Epidemiology, Loddenkemper, Christine; University Witten Herdecke Faculty of Health, Institute for Medical Biometry and Epidemiology Baulig, Christine; University Witten Herdecke Faculty of Health, Institute for Medical Biometry and Epidemiology
Primary Subject Heading:	Dentistry and oral medicine
Secondary Subject Heading:	Dentistry and oral medicine, Evidence based practice
Keywords:	ORAL & MAXILLOFACIAL SURGERY, ORAL MEDICINE, STATISTICS & RESEARCH METHODS

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3 **Assessment of reporting quality in randomized controlled clinical trial abstracts**
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5 **of dental implantology published from 2014 – 2016**
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10 **Short title:** Reporting quality in RCT abstracts of dental implantology
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14 Stephanie Knippschild¹, Jeremias Loddenkemper¹, Sabrina Tulka¹, Christine
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16 Loddenkemper¹, Christine Baulig¹
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53 **Word count:** 4846
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58 **Keywords:** quality, abstracts, CONSORT, CONSORT-A
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3 **Objectives:** Access to full texts of randomized controlled clinical trials (RCTs) is often
4 limited, so brief summaries of studies play a pivotal role. In 2008, a checklist was
5 provided to ensure the transparency and completeness of abstracts. The aim of this
6 investigation was to estimate adherence to the reporting guidelines of the CONSORT
7 criteria for abstracts (CONSORT-A) in RCT publications.
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12 **Primary endpoint:** Assessment according to the percentage of compliance with the
13 16 CONSORT-A criteria per study.
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17 **Materials and methods:** This study is based on a full survey (212 RCT abstracts in
18 dental implantology, PubMed search, publication period 2014–2016, 45 journals,
19 median impact factor: 2.328). In addition to merely documenting “adherence” to
20 criteria, the authors also assessed the “complete implementation” of the requested
21 information where possible. The collection of data was performed independently by
22 two dentists, and a final consensus was reached. The primary endpoint was evaluated
23 by medians and quartiles. Additionally, a Poisson regression was conducted to detect
24 influencing factors.
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39 **Results:** A median of 50% [Q1-Q3: 44%-63%] was documented for the 16 criteria
40 listed in the CONSORT-A statement. Nine of the 16 criteria were considered in fewer
41 than 50% of the abstracts. “Correct implementation” was achieved for a median of 43%
42 (Q1-Q3: 31%-50%) of the criteria. An additional application of Poisson regression
43 revealed that the number of words used had a locally significant impact on the number
44 of reported CONSORT criteria for abstracts (IRR 1.001, 95% CI 1.001 to 1.002).
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53 **Conclusion:** Transparent and complete reporting in abstracts appears problematic. A
54 limited word count seems to result in a reduction in necessary information. As current
55 scientific knowledge is often not readily available in the form of publications, abstracts
56 constitute the primary basis for decision-making in clinical practice and research. This
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3 is why journals should refrain from limiting the number of words too strictly in order to
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5 facilitate comprehensive reporting in abstracts.
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11 **Strengths and limitations of this study**

14 **1. Literature search**

16 We searched one electronic database – PubMed – because it comprises more than 30 million
17 citations for biomedical literature from MEDLINE and has been declared the world's largest
18 and most important medical bibliographic database.
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21 **2. Data extraction**

22 Two dentists reviewed the abstracts in parallel and independently of each other; the final set
23 of data was produced in consensus.
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27 **3. Reporting quality by assessing the adherence and correct implementation of the CONSORT 28 statement**

29 This approach - for assessing the reporting quality - is new in the field of dental implantology;
30 in addition to merely documenting “adherence” to criteria, the authors also assessed “correct
31 implementation” of the requested information.
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39 **Funding**

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41 This research received no specific grant from any funding agency in the public, commercial or
42 nonprofit sectors.
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Assessment of reporting quality in randomized controlled clinical trial abstracts of dental implantology published from 2014 – 2016

Background and Objective

Transparent and comprehensive reporting forms the basis for the evaluation and interpretation of published scientific findings. The EQUATOR network currently provides a total of 425 guidelines on reporting in health research to improve the quality of reporting in health care studies[1]. The CONSORT statement contains recommendations for reporting randomized controlled clinical studies (RCTs) that present the highest evidence level (Ib) and serve as a basis for recommendations and therapy decisions derived from these trials in daily clinical routines as well as evidence-based practice. The CONSORT group has developed guidelines for a variety of study designs, interventions and data and makes checklists available to authors to be used in the preparation of publications[2]. A specific checklist to generate abstracts has been available since 2008, as this part of a publication plays a key role: researchers and physicians worldwide use information from abstracts of publications to assess the relevance and further exploitation of a scientific paper. An abstract, i.e., a publication in miniature format, should, therefore, convey all necessary information from a scientific study.

A look at the current literature reveals differences among published abstracts in terms of completeness, structure and scope, despite existing and freely available guidelines. Reporting is frequently nontransparent and incomplete, which inevitably leads to two problems:

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1. **Fragmented and incomplete abstract reporting of study results prevents decision-making about therapies in daily clinical routines.**

Due to increasing time constraints in hospitals and a rapidly growing number of published study results, many interested individuals only have time to read the abstracts[3]. On this basis, they need to decide for or against the inspection or acquisition of full texts and possibly for or against a therapy.

Even though it is strongly advised to include the full texts for decision-making, there may be circumstances in which this advice cannot always be followed. This is also regularly described in publications[4]. In regions with fewer health care resources, in particular, limited, chargeable and expensive access to full texts forces medical staff to make treatment decisions exclusively on the basis of abstracts[5]. This leads to a high risk of mistakes with possibly far-reaching consequences for patients.

2. **Fragmented and incomplete abstract reporting of study results complicates the compilation of reviews, meta-analyses and evidence-based information in medicine.**

In 2021, Lund et al. published the following key finding: “An evidence-based research approach – the use of existing evidence in a transparent and explicit way – is needed to justify the need for and design a new study”[6]. Especially in projects with moderate or no funding, a literature search is followed by abstract screening to identify relevant literature and to reduce the costs for the procurement of literature to a minimum. Non-transparent or fragmentary reporting in abstracts entails the risk that relevant study reports will not be considered since the presentation of the results may be incomplete, incorrect or

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3 selective. Relevant studies could not be found for the preparation of reviews
4 and meta-analyses. This effect is especially critical for the drafting of
5 recommendations, where RCT reporting is used for an evidence-based
6 presentation of the results. As a consequence of unclear and incomplete
7 reporting, it cannot be excluded that articles of importance to the formulation of
8 therapeutic guidelines are not identified and therefore not considered.
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18 These problems are widespread in publications on various clinical indications[7-10]. In
19 oral implantation, we found one publication that assessed the reporting quality in
20 abstracts of randomized controlled trials[11]. This study determined a mean overall
21 reporting quality score of 58.6% in RCTs by focusing on six leading implantology
22 journals between 2008 and 2012. Our investigation aimed to provide updated results
23 to identify the extent to which authors in the field comply with recommendations
24 provided in the CONSORT statement for the compilation of transparent and complete
25 abstracts. The objective was to check RCT publications in dental implantology (2014-
26 2016) for information as requested by the CONSORT statement for abstracts.
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42 **Materials and Methods**

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44 The authors of this study examined abstracts of published study reports in dental
45 implantology for compliance with 16 criteria recommended by CONSORT-A[12]. The
46 objective was to identify the degree – by percent and per study – to which all criteria
47 requested in CONSORT-A were adhered to (primary endpoint). Secondary research
48 questions served to identify possible factors via regression analysis, which may result
49 in a better implementation of CONSORT criteria. These criteria were also assessed in
50 terms of their correct and meaningful documentation. Assessment was conducted in
51 two steps. For an assessment of the “degree of adherence I”, the focus was exclusively
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3 on the documentation (retrievability) of information in abstracts as requested by
4 CONSORT-A. For an assessment of the degree of adherence II, correctness and
5 completeness as required by CONSORT-A[2, 12, 13] were evaluated. It was only
6 possible to collect this information for 6 out of 16 criteria since an assessment of
7 correctness would not have made sense for the remaining criteria. Assessment of the
8 “degree of adherence II” is based on requirements defined in the CONSORT-A
9 statement,[12] as well as on information required in “Explanation and Elaboration”[13].
10 The latter provides a clear description of reporting on individual criteria in several
11 subsections. An assessment in terms of requirements for the degree of adherence II
12 was possible for six criteria (see Supplementary Table 1).

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26 A literature search of the publication period 01/2014 to 12/2016 via the PubMed search
27 engine of the MEDLINE medical database formed the basis for the analysis. We
28 performed a very unrestricted search to obtain as many hits as possible. For this
29 purpose, the keywords “dental implantation”, “dental implant” and “tooth artificial” were
30 combined with the logical operator OR. The type of study was restricted to randomized
31 controlled clinical trials (RCTs) (Supplementary Table 2). The software programme
32 Excel[14] was used to compile data, and the data mask was generated on the basis of
33 the CONSORT statement for abstracts[12].

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At the start of the project, a tool for evaluating abstract quality was available from a
preceding study[8], which had to be slightly adapted and extended for the purposes of
this investigation by its planners. All 16 CONSORT-A criteria were included in data
compilation and analysis. General information on each publication was documented to
facilitate a clear classification of reports at a later time, as well as additional data to be
examined for their potential impact on reporting quality (year of publication, “structured”
or “unstructured” presentation of the abstract, the number of patients included, the
word count and the impact factor of the respective journal).

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3 Two dentists reviewed the abstracts in parallel and independently of each other. The
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5 final data set was drawn up in consensus (JL, CL). Data analysis was performed using
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7 the SPSS Statistics 24 software programme (SK, CB)[15]. The authors determined
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9 relative frequencies and interquartile ranges for study-related implementation rates
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11 and for the implementation of individual criteria. The results at the primary endpoint
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13 are depicted in box plots. Criteria-related frequencies are illustrated with bar charts[14].
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19 Possible factors influencing the quality of the abstracts measured by the number of
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21 criteria fulfilled per publication were identified by means of an additional explorative
22
23 data analysis via Poisson regression (ST). Backward variable selection was performed
24
25 with the Akaike information criterion (AIC). Incidence rate ratios (IRRs), including 95%
26
27 confidence intervals and respective p-values determined via the Wald test, were used
28
29 to describe the impact. Year of publication (reference: 2014), presence of a structured
30
31 abstract (reference: no), number of patients analysed, impact factor and word count
32
33 were examined as potential influencing factors. The analysis was conducted using the
34
35 software programme R (R Core Team, 2015).
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42 **Patient and public involvement:**

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44 No patients were directly involved.
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49 **Results**

50 **Research results**

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52 The electronic search yielded a data pool of 262 reports, 40 abstracts of which had to
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54 be excluded after a first screening due to a mismatch in disciplines. Ten additional
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56 abstracts were excluded because the publications in question did not report clinical
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studies. As a result, a total of 212 abstracts from RCT publications (see Fig. 1) were included in this study.

General study characteristics and journals

The analysis included RCT abstracts from 45 journals (see Supplementary Table 3) with a median IF of 2.3280 (min. 0, max. 5.62). Two journals, the “European Journal of Implantology” (36 of 212 abstracts; 17%) and “Clinical oral implants research” (36 of 212 abstracts; 17%), accounted for approximately one-third of the abstracts. Table 1 shows the general study characteristics for the data pool evaluated. Most of the information was available in a structured form (174/212; 82%) with a median of 258 words (min. 94 words[16] and max. 659 words[17]). The abstracts reported case numbers ranging from 10[18-20] and 360[21] from published studies. The median number of study participants was 36.

Study characteristics	Frequencies	
Form of abstract	structured	174 (82%)
	unstructured	38 (18%)
Year of publication	2014	101 (48%)
	2015	74 (35%)
	2016	37 (17%)
Journals	European Journal of Oral Implantology	36 (17%)
	Clinical oral implants research	36 (17%)
	The International Journal of Oral & Maxillofacial Implants	23 (11%)
	Clinical implant dentistry and related research	22 (11%)
	other	95 (45%)
Provenance	Europe	70 (33%)
	America	21 (10%)
	Africa	6 (3%)
	Asia	35 (17%)
	Not specified	80 (38%)
Word count (median)	258 [Min. 94; Max. 659]	
Number of cases analysed (median)	36 [Min. 10; Max. 360]	
Impact factor (median)	2.3280 [Min. 0; Max. 5.62]	

Table 1: Study characteristics of 212 RCT abstracts of implantology in terms of the frequency [N] and relative frequency (%).

Implementation rate per study

The studies included showed a median implementation of CONSORT-A recommendations (degree of adherence I) of 50% (Q1-Q3 43.8% to 62.5%) per abstract, whereby eight out of 16 criteria were documented (min. 7, max. 14 criteria); see also Supplementary Figure 1. The criterion with the highest percentage of documentation was “intervention” (100%). A documentation of less than 10% was found for “trial registration” and “funding” (see Table 2).

CONSORT criterion	Implementation N (%) Degree of adherence I	Implementation N (%) Degree of adherence II
Identification as a randomized trial in the title	95 (45)	95 (45)*
Trial design	66 (31)	66 (31) *
Participant characteristics	154 (73)	154 (73) *
Interventions	212 (100)	200 (94)
Objective	209 (99)	209 (99) *
Definition primary endpoint	198 (93)	117 (55)
Randomization	35 (17)	13 (6)
Blinding	41 (19)	21 (10)
Numbers randomised	97 (46)	97 (46) *
Recruitment	196 (93)	196 (93) *
Numbers analysed	57 (27)	57 (27)*
Results of Outcome	207 (98)	133 (63)
Harms	23 (11)	23 (11) *
Conclusion	204 (96)	47 (22)
Trial Registration	10 (5)	10 (5) *
Funding	8 (4)	8 (4) *
Total		

Table 2: Implementation N [%] of CONSORT criteria for abstracts in 212 reports of published RCTs in the field of implantology. Presentation of the degree of adherence I (information given in the abstract) and degree of adherence II (correct documentation in accordance with CONSORT-A). * Variables without a formal degree of adherence II.

In terms of correct implementation (degree of adherence II), a median implementation of 40.6% (6.5 criteria) was found with an interquartile range of 31.3% to 50.0%. One abstract[22] revealed the lowest implementation with only the “Objective” criterion

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2
3 (6.25%), whereas Esposito et al., 2014 documented a maximum number of 13 criteria
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5 (81.25%).
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7 For the “randomization” (documentation 17%, correct implementation 6%) and
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9 “conclusion” (documentation 96%, correct implementation 22%) criteria, the authors
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11 found a decrease of $\geq 50\%$ in the implementation rate from the degree of adherence I
12
13 to the degree of adherence II (see Table 2).
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17 18 19 **Implementation rates per criterion**

20 21 *General criteria*

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23 Among the 212 abstracts included, 45% mentioned RCTs as the study design in the
24
25 title of the study (95/212). Thirty-one percent provided a more detailed description of
26
27 the study design, such as parallel group studies, blinded studies, and placebo-
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29 controlled studies (66/212).
30
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33 34 35 *Methods*

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37 The “aim of the study” was documented in 99% of the abstracts examined (209/212).
38
39 Information on the “primary endpoint” was given in 93% (198/212); this information
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41 was, however, clearly defined in only 55% (117/212), including specification of the
42
43 measurement variable. “Eligibility criteria for participants and the settings” were found
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45 in 73% (154/212) of the abstracts, while complete documentation of the “intervention
46
47 for each group” was found in all 212 abstracts (100%). Ninety-four percent (200/212)
48
49 reported a detailed description of the intervention for each group. Random allocation
50
51 of participants to the intervention group was documented in 17% (35/212) of cases;
52
53 only 6% (13/212) of abstracts contained data on the generation of the random
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55 sequence and its implementation. Nineteen percent (41/212) of abstracts mentioned
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57 blinding prior to the study; 10% (21/212) also indicated blinded groups of participants.
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Results

In terms of result presentation, 93% (196/212) of abstracts provided information on the current status of the study (study completed, interim analysis after xy years). The number of randomized participants was given in 46% (97/212) of abstracts and in 27% (57/212) of the analysed participants. A total of 98% (207/212) of abstracts included reported results at the primary endpoint, but only 63% (133/212) of abstracts contained a precise effect size. Eleven percent (23/212) of the examined RCT abstracts documented major (significant) harms. Ninety-six percent (204/212) provided a general summary of the results; only 22% (47/212) described the strengths and deficits of the respective study. The registration ID was documented in 5% (10/212) of the abstracts, and information on funding was documented in 4% (8/212).

The additional explorative analysis by means of Poisson regression included 199 out of 212 abstracts, since 13 abstracts did not provide information on all potential influencing factors. For both degrees of adherence – I and II – the number of words used was shown to have a locally significant impact on the number of reported CONSORT abstract criteria (degree of adherence I: IRR 1.001, 95% CI 1.001 to 1.002; degree of adherence II: IRR 1.002, 95% CI 1.001 to 1.003). The percentages of explained variance according to Nagelkerke's R^2 were 14% and 21%, respectively. The other possible influencing variables – year of publication, presence of a structured abstract, number of patients included and impact factor – were not selected in the backward variable selection via AIC and had no significant influence on the number of reported CONSORT-A criteria.

Discussion

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3 This study examined the degree to which recommendations of the CONSORT
4 statement for abstracts were implemented in trial publications on dental implantology.
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6 A total of 212 abstracts published 2014 to 2016 showed a median documentation of
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8 the required criteria (degree of adherence I) of only 50%. When focusing on “correct”
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10 compliance with the requirements of the statement (in this context: degree of
11
12 adherence II), adherence declined to 40.6% (see Fig. 2 and Table 2).
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19 A comparison of all criteria revealed that the two criteria, “funding” and “trial
20 registration”, were rarely documented (5% and 4%, respectively). In general, journal
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22 editors request these details separately, and they are mentioned in the publication but
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24 quite often not in the abstract.
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28 In addition, the content of abstracts is often massively reduced by word count
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30 limitations requested by the publishers. A Poisson regression analysis conducted for
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32 the purposes of this study showed that word count limits were responsible for lesser
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34 reporting quality or missing details in abstracts (IRR 1.001, 95% CI 1.001 to 1.002).
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36 The influence of the number of words used in the abstract was documented in a
37
38 previous study by Baulig et al. (N=136) (Poisson regression-based IRR 1.002, 95% CI
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40 1.001 to 1.003). This previous study explored the abstract quality in ophthalmology
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42 RCTs on age-related macular degeneration. The analysis revealed a median
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44 implementation of seven criteria (95% CI 7 to 8)[8]. The results are similar to those
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46 found in the present study in the field of dental implantology. In 2020, Xie et al. also
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48 investigated the quality of 249 randomized controlled trial abstracts published in dental
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50 science[23]. They found major gaps in the documentation of general items (5.6%
51
52 documented trial registration), methods (only one publication, i.e., 0.4%, noted the
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54 sequence generation procedure for randomization and allocation concealment; in 7.6%
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56 of the papers reviewed, blinding was described; and a clearly stated primary outcome
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3 was documented in only 16.9%), trial results (the number of participants analysed was
4 only described in 8.8%, and adverse events were described in only 14.9%). As in our
5 study, this research group also found a significant association between word count
6 requirements and reporting quality (multivariable linear regression ($B=0.020$; $P<0.001$)).
7
8 Notwithstanding any word count limitations, minor additional information (such as
9 registration ID, identification as RCT in the title, specification of patient numbers at
10 randomization or analysis) can be included in the text (e.g., numbers in brackets)
11 without the need for more words. Such inclusions provide important information on
12 indexing or for the benefit of readers and improve the transparency required for
13 abstracts. A publication by Berwanger et al.[24] offers an excellent template for
14 transparent and comprehensive reporting in abstracts even if the word count has been
15 restricted.

16
17 The assessment of the documentation of the CONSORT-A criteria in this paper is
18 based exclusively on abstracts. Original texts (full texts) or information provided
19 outside the abstract text were not examined and were not taken into consideration.
20 Since the two criteria “funding” and “trial registration” do not necessarily have to be
21 included in the abstract and a subjective presentation of the implementation ratio might
22 be a consequence, to the detriment of the authors’ duty of documentation, an additional
23 data evaluation seemed advisable, based on only 14 criteria after excluding the
24 “funding” and “trial registration” criteria. This further evaluation yielded a somewhat
25 higher “implementation ratio” for the degree of adherence I of 57.1% with an
26 interquartile range of 50.5% to 71.4% (see Supplementary Fig. 2). For the degree of
27 adherence II, the authors still found a reduced implementation ratio of 42.9% (Q1-Q3;
28 35.7% - 57.1%). A median of eight criteria (interquartile range 7-10 criteria) was
29 documented, and six criteria were correctly implemented (interquartile range 5-8
30 criteria). It was, however, obvious from both data pools (14 vs. 16 criteria) that a far

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3 smaller number of CONSORT-A criteria were identified as having been included when
4 correct implementation was examined in addition to mere documentation (see
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8 Supplementary Fig. 3).
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12 A data analysis of 14 CONSORT-A criteria by means of Poisson regression also
13 revealed a locally significant influence of the abstract word count on the quality of
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17 abstracts (degree of adherence I: IRR 1.001, 95% CI 1.001 to 1.002, $p < 0.001$; degree
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19
20 of adherence II: IRR 1.002, 95% CI 1.001 to 1.003, $p < 0.001$). The percentage of
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23 explained variance according to Nagelkerke's R^2 was 13% and 20%, respectively.
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26 Other possible influencing variables, i.e., year of publication, availability of a structured
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29 abstract, number of patients included and impact factor were again not selected in the
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32 backward selection via AIC and had no significant impact on the number of CONSORT-
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35 A criteria reported in the abstracts included.

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37 Findings from a doctoral project were presented in the context of this study; the project
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40 in question did not receive any financial support or assistance. A literature search was
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43 therefore exclusively conducted by means of the internet-based literature database
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46 PubMed with a total of over 30 million quotations for biomedical literature from
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49 MEDLINE, life science journals and online books that were directly available free of
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52 charge to all researchers involved. When interpreting the findings of this study, readers
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55 should therefore be aware that the inclusion of only one database might lead to a bias
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58 of results (deviation in the estimated degree of implementation).

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60 However, we assume that only a few publications could have been found when
searching additional databases, as PubMed includes all relevant implantology journals.
The evaluation of congress abstracts, which might have been found in Embase, were
explicitly not part of this investigation. In this respect, the authors assumed that the

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3 results would not have been significantly improved if a few additional studies had been
4 considered in this analysis. The search was limited in time to the three-year period
5 from 01/2014 - 12/2016. Up to 2012, implantological abstracts had been examined by
6 Kiriakou et al. A follow-up examination should therefore be carried out on more recent
7 studies.
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12 To minimize bias on the part of the evaluators, two researchers / physicians performed
13 the analysis in parallel and independently of each other. Abstract evaluation was based
14 on .txt files that were generated directly in PubMed after completing the search
15 operation. This strategy ensured that all abstracts were available in the same visual
16 form and ruled out any influence due to the graphical representation of the abstracts.
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18 However, evaluators were not blinded with respect to the journals, authors and
19 publication periods, so a possible assessor bias can be assumed.
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33 The calculation of Cohen's kappa shows a high conformity between the assessors for
34 eight out of 16 criteria (see Supplementary Table 4). With a focus on the percentage
35 of correlation, the lowest degree of conformity between assessors was identified for
36 the "harms" criterion (62%; $\kappa=0.041$). Information on this aspect may possibly be more
37 or less deduced from the abstract (if one reads between the lines) and is not always
38 explicitly presented as health disadvantages for patients. An evaluation of abstract
39 quality performed in a previous study in the field of ophthalmology (Baulig et al., 2018)
40 served as a basis for the present study in terms of the assessment tool, evaluation
41 procedure and the evaluation so that no study protocol was deemed necessary for the
42 present study.
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58 Several publications on other clinical indications with similar research questions
59 confirmed our results for the general implementation of criteria. Gallo et al. analysed
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3 126 abstracts from 2011 to 2018 for the rate of implementation. The authors found that
4
5 in general, seven criteria (SD \pm 2) were considered per publication. "Trial registration",
6
7 "method of randomization" and "source of trial funding" were documented with a
8
9 frequency of less than 5%[25]. Chow et al. reported on adherence to CONSORT
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11 criteria in 395 abstracts in the field of anaesthesiology. Their study documented that
12
13 75% of these abstracts from RCTs published in 2016 met less than half of the 16
14
15 criteria. In line with the present study, their examination revealed that not a single one
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17 of the included publications took all 16 CONSORT criteria for abstracts into
18
19 consideration. An implementation rate of < 50% was found for the following criteria:
20
21 "designation in the title", "study design", "baseline data", "objective", "randomization",
22
23 "blinding", "number of randomized participants", "outcome", "registration" and
24
25 "funding"[26]. Speich et al. explored the abstract quality in published study reports from
26
27 the field of surgery (2014 – 2016)[27]. They found a general implementation of eight
28
29 criteria (95% CI 7.83 - 8.39), with "randomization", "blinding" and "funding" have been
30
31 considered in less than 20%.

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33 The abovementioned reports are consistent with the present study in terms of the low
34
35 number of criteria met, as well as of those criteria for which the lowest degree of
36
37 adherence was found. The authors criticize in particular the documentation of
38
39 "randomization", "blinding" and "number of randomized/analysed participants". The
40
41 "Explorations & Elaborations" section describes in detail how the 16 required
42
43 CONSORT-A criteria contribute to the completeness and sufficient transparency of an
44
45 abstract, with the relevance of individual criteria and their processing not being under
46
47 discussion in this context. The literature provides no clues as to a possibly larger or
48
49 smaller impact of criteria on reporting quality. However, future studies should consider
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51 a weighting of required criteria, with the possible consequence that future studies can
52
53 present the degree of implementation in a more objective manner.
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3 In addition to the poor documentation of the “blinding”, “randomization” and “harms”
4
5 criteria, our study revealed additional massive deficits in the documentation of
6
7 “definition of primary endpoint”, “results/outcomes” and “conclusion” (see Table 2 and
8
9 Fig. 3). In the evaluation of “correctness”, the degree of adherence declined by at least
10
11 30%, since pertinent information was documented in the abstract but not in the manner
12
13 required by CONSORT-A. Deficits in the implementation of CONSORT-A
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15 recommendations therefore tend to occur more frequently for the methodological
16
17 criteria, as was previously confirmed by Ghimire et al.
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21 This research team reports a documentation of randomization (“Allocation
22
23 Concealment”) in only 12% of abstracts and of blinding in only 21%[28]. Obviously,
24
25 there are criteria that authors adhere to in general, and a few others (statistical criteria)
26
27 that are reported infrequently. It can be assumed that a large number of individuals are
28
29 involved in the compilation of an abstract (publication), so that different text sections
30
31 are inevitably drawn up in different contexts while applying different quality standards
32
33 (transparency and completeness). This may explain deficits in specific areas. Deficits
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35 in statistical aspects in particular might be reduced by involving medical
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37 statisticians/biometricians in the compilation of publications and during the review
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39 process.
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45 To date, some investigations have been conducted on reporting quality in abstracts in
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47 dental research. Flemming et al. reported an overall reporting quality score of 60.2%
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49 in abstracts of five orthodontic journals from 2006 to 2011[29]. For this evaluation, 117
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51 RCT abstracts were assessed by using a modified CONSORT for abstract checklists
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53 containing 21 items. In particular, the items “randomization procedures”, “allocation
54
55 concealment”, “blinding”, “failure to report confidence intervals” and “harms” were
56
57 found to be reported insufficiently. Seehra et al. published a mean overall reporting
58
59 quality in dental specialty journals of 62.5% (N= 228 RCT abstracts)[30]. The research
60

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3 group found that randomization restrictions, allocation concealment, blinding, numbers
4 analysed, confidence intervals, intention-to-treat analysis, harms, registration and
5 funding were rarely described. The research group from Faggion et al. compared the
6 quality of reporting in abstracts between 2005-2007 and 2009-2011 in seven leading
7 journals of periodontology and implant dentistry[31]. They included 392 abstracts in
8 their review and found the quality of reporting to be improvable. Only the
9 documentation of the title significantly improved over time.

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19 The reporting quality in abstracts of randomized controlled trials in oral implantology
20 was assessed by Kiriakou et al. in 2012[11]. Therefore, six leading implantology
21 journals were reviewed from 2008 to 2012. Abstracts were assessed as providing
22 either “no description”, “inadequate description” or “adequate description”. The results
23 showed a mean overall reporting quality score of 58.6% (95% CI: 57.6 – 59.7), with
24 insufficient reporting of the randomization procedures and allocation concealment
25 items. They also found failure in reporting confidence intervals, effect estimates and
26 sources of funding.

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38 In contrast to existing investigations assessing abstract reporting quality in dentistry,
39 we used CONSORT-A without modifying the number of items. However, we found a
40 similar degree of implementation as the authors mentioned above. The new findings
41 from our investigation clearly show that there is a difference between the
42 implementation of guidelines and fully documented/correct implementation (50%
43 implementation vs. 40.6% fully/correct implementation).

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Currently, 585 journals refer authors to the CONSORT statement[32]; nevertheless, there is an urgent need to improve abstracts. Findings from this study suggest that not all authors pay attention to the CONSORT statement as recommended by journals. The statement for abstracts and the corresponding checklist as well as the interactive

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3 exploration platform provided in this context (CONSORT, 2019b; Hopewell et al.,
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5 2008b) appear to be inadequate to ensure transparent and comprehensive reporting
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7 even though they contain exact and detailed instructions for implementation as well as
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9 specific examples. A particularly worrying fact is that this low rate of implementation
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11 was also found for criteria that are easy to meet, such as the identification of a
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13 publication as an RCT in the title, documentation of registration ID, or reporting the
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15 number of participants included in the analysis. It seems reasonable to assume that
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17 recommendations for the publication standard were not implemented because authors
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19 would have to study additional literature for this purpose, and might not have the time
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21 or patience to do so.
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26 Many journals support the idea of explicitly requesting authors to use the CONSORT
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28 checklist; CONSORT is endorsed by over 50% of the core medical journals listed in
29
30 the *Abridged Index Medicus* on PubMed as of April 2020[33]. A general request to
31
32 adhere to the CONSORT-A checklist in the drafting of publications and a demand for
33
34 obligatory implementation on the part of all journals may further improve reporting
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36 quality in abstracts and thus promote comprehensive and transparent presentation.
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38 Moreover, reviewers should check their data for completeness and correctness
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40 according to CONSORT-A. Bearing in mind that publications are reviewed under
41
42 increasing time pressure, and primarily outside the job and on an honorary basis, the
43
44 entire review system might have to be reconsidered. One option would be to check
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46 abstracts/publications for completeness of reporting as a preliminary step, followed by
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48 the actual review procedure. By implementing this additional step, papers that are not
49
50 well structured and non-transparent may be identified early in the review process and
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52 sent back for revision. Even if that means that additional human resources have to be
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54 deployed, it seems to be an opportunity to focus the journals' review process on
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56 content-related items.
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Conclusion

Even though the CONSORT group gave recommendations for the compilation of abstracts as early as 2008, the quality of such “miniature publications” remains suboptimal. Co-authors well versed in statistics should address and / or check methodological criteria, in particular when drafting abstracts and during the review process. Word count limitations seem to be another reason for the omission of important information. Abstracts play a key role for readers, and journals should not restrict the admissible number of words too rigidly.

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3 **Authors' contributions:** Stephanie Knippschild wrote the initial draft of this
4 manuscript and performed major parts of the statistical analysis. Jeremias
5 Loddenkemper screened all abstracts of the literature search through PubMed and
6 documented suitable publications for further processing. Moreover, he extracted the
7 necessary information for evaluating the abstract quality and performed data entry and
8 data validation. Sabrina Tulka conducted the regression analysis and revised the initial
9 draft of this manuscript. Christine Loddenkemper validated the pool of studies by
10 screening all abstracts and evaluating the studies included. Christine Baulig designed
11 the review and its analysis concept; she implemented the literature search, including
12 the identification of those RCTs to be included in the review and thoroughly revised the
13 initial draft of this manuscript.
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31 **Acknowledgement**

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34 The authors thank Christina Wagner for linguistic support in the preparation of this
35 manuscript.
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40 **Competing interests**

41
42
43 This study is part of the doctoral thesis written by Mr. Jeremias Loddenkemper in pursuit of a
44 doctoral degree in dental medicine ("Dr. med. dent.") at Witten/Herdecke University.
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47

48 Furthermore, the results contained in this article have already been presented as part of a
49 poster presentation at the 33rd DGI Congress, Hamburg (28-30 November 2019).
50
51

52 The authors declare that they have no competing financial, professional or personal interests
53 that might have influenced the performance or presentation of the work described in this
54 manuscript.
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Non-financial competing interests

Data sharing

This manuscript contains data from an ongoing doctoral project. Therefore data cannot be made available until completion.

Ethics Statement

This study constitutes an analysis of published abstracts on RCTs and therefore does not require approval by an ethics committee.

For peer review only

Reference list

1. EQUATOR-Network. EQUATOR-Network: Minervation Ltd; [Available from: <https://www.equator-network.org/reporting-guidelines/>].
2. CONSORT. Extensions of the CONSORT Statement 2019 [Available from: <http://www.consort-statement.org/extensions>].
3. Barry HC, Ebell MH, Shaughnessy AF, et al. Family physicians' use of medical abstracts to guide decision making: style or substance? *J Am Board Fam Pract* 2001;14:437-42.
4. Sivendran S, Newport K, Horst M, et al. Reporting quality of abstracts in phase III clinical trials of systemic therapy in metastatic solid malignancies. *Trials* 2015;16:341.
5. Barbour V, Chinnock P, Cohen B, et al. The impact of open access upon public health. *Bull World Health Organ* 2006;84:339.
6. Lund H, Juhl CB, Norgaard B, et al. Evidence-Based Research Series-Paper 2 : Using an Evidence-Based Research approach before a new study is conducted to ensure value. *Journal of clinical epidemiology* 2021;129:158-66.
7. Alharbi F, Almuzian M. The quality of reporting RCT abstracts in four major orthodontics journals for the period 2012-2017. *J Orthod* 2019;46:225-34.
8. Baulig C, Krummenauer F, Geis B, et al. Reporting quality of randomised controlled trial abstracts on age-related macular degeneration health care: a cross-sectional quantification of the adherence to CONSORT abstract reporting recommendations. *BMJ Open* 2018;8:e021912.
9. Khan MS, Shaikh A, Ochani RK, et al. Assessing the Quality of Abstracts in Randomized Controlled Trials Published in High Impact Cardiovascular Journals. *Circ Cardiovasc Qual Outcomes* 2019;12:e005260.
10. Kuriyama A, Takahashi N, Nakayama T. Reporting of critical care trial abstracts: a comparison before and after the announcement of CONSORT guideline for abstracts. *Trials* 2017;18:32.
11. Kiriakou J, Pandis N, Madianos P, et al. Assessing the reporting quality in abstracts of randomized controlled trials in leading journals of oral implantology. *The journal of evidence-based dental practice* 2014;14:9-15.
12. Hopewell S, Clarke M, Moher D, et al. CONSORT for reporting randomised trials in journal and conference abstracts. *Lancet* 2008;371:281-3.
13. Hopewell S, Clarke M, Moher D, et al. CONSORT for reporting randomized controlled trials in journal and conference abstracts: explanation and elaboration. *PLoS medicine* 2008;5:e20.
14. Excel®. Microsoft® Excel® 2010. Redmond WA USA Microsoft Corporation. ; 2010.
15. Released IC. IBM SPSS Statistics for Windows. Version 26.0 ed. NY: IBM Corp 2020.
16. De Angelis N, Nevins ML, Camelo MC, et al. Platform switching versus conventional technique: a randomized controlled clinical trial. *The International journal of periodontics & restorative dentistry* 2014;34 Suppl 3:s75-9.
17. Pistilli R, Felice P, Piatelli M, et al. Blocks of autogenous bone versus xenografts for the rehabilitation of atrophic jaws with dental implants: preliminary data from a pilot randomised controlled trial. *European journal of oral implantology* 2014;7:153-71.
18. Gocmen G, Atali O, Aktop S, et al. Hyaluronic Acid Versus Ultrasonic Resorbable Pin Fixation for Space Maintenance in Non-Grafted Sinus Lifting. *Journal of oral and maxillofacial surgery : official journal of the American Association of Oral and Maxillofacial Surgeons* 2016;74:497-504.
19. Kasperski J, Rosak P, Roj R, et al. The influence of low-frequency variable magnetic fields in reducing pain experience after dental implant treatment. *Acta Bioeng Biomech* 2015;17:97-105.
20. Torroella-Saura G, Mareque-Bueno J, Cabratosa-Termes J, et al. Effect of implant design in immediate loading. A randomized, controlled, split-mouth, prospective clinical trial. *Clinical oral implants research* 2015;26:240-4.
21. Arduino PG, Tirone F, Schiorlin E, et al. Single preoperative dose of prophylactic amoxicillin versus a 2-day postoperative course in dental implant surgery: A two-centre randomised controlled trial. *European journal of oral implantology* 2015;8:143-9.

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3 22. Arbab H, Greenwell H, Hill M, et al. Ridge Preservation Comparing a Nonresorbable PTFE
4 Membrane to a Resorbable Collagen Membrane: A Clinical and Histologic Study in Humans. *Implant*
5 *dentistry* 2016;25:128-34.
- 6 23. Xie L, Qin W, Gu Y, et al. Quality assessment of randomized controlled trial abstracts on drug
7 therapy of periodontal disease from the abstracts published in dental Science Citation Indexed journals
8 in the last ten years. *Medicina oral, patologia oral y cirugia bucal* 2020;25:e626-e33.
- 9 24. Berwanger O, Ribeiro RA, Finkelsztein A, et al. The quality of reporting of trial abstracts is
10 suboptimal: survey of major general medical journals. *Journal of clinical epidemiology* 2009;62:387-92.
- 11 25. Gallo L, Wakeham S, Dunn E, et al. The Reporting Quality of Randomized Controlled Trial
12 Abstracts in Plastic Surgery. *Aesthet Surg J* 2020;40:335-41.
- 13 26. Chow JTY, Turkstra TP, Yim E, et al. The degree of adherence to CONSORT reporting guidelines
14 for the abstracts of randomised clinical trials published in anaesthesia journals: A cross-sectional study
15 of reporting adherence in 2010 and 2016. *Eur J Anaesthesiol* 2018:942-8.
- 16 27. Speich B, Mc Cord KA, Agarwal A, et al. Reporting Quality of Journal Abstracts for Surgical
17 Randomized Controlled Trials Before and After the Implementation of the CONSORT Extension for
18 Abstracts. *World J Surg* 2019:2371-8.
- 19 28. Ghimire S, Kyung E, Kang W, et al. Assessment of adherence to the CONSORT statement for
20 quality of reports on randomized controlled trial abstracts from four high-impact general medical
21 journals. *Trials* 2012;13:77.
- 22 29. Fleming PS, Buckley N, Seehra J, et al. Reporting quality of abstracts of randomized controlled
23 trials published in leading orthodontic journals from 2006 to 2011. *Am J Orthod Dentofacial Orthop*
24 2012;142:451-8.
- 25 30. Seehra J, Wright NS, Polychronopoulou A, et al. Reporting quality of abstracts of randomized
26 controlled trials published in dental specialty journals. *The journal of evidence-based dental practice*
27 2013;13:1-8.
- 28 31. Faggion CM, Jr., Giannakopoulos NN. Quality of reporting in abstracts of randomized controlled
29 trials published in leading journals of periodontology and implant dentistry: a survey. *Journal of*
30 *periodontology* 2012;83:1251-6.
- 31 32. CONSORT. Endorsers - Journals and Organizations: CONSORT; 2019 [Available from:
32 <http://www.consort-statement.org/about-consort/endorsers1>.
- 33 33. Group TC. Endorsers-Journals and Organizations 2020 [Available from: [http://www.consort-](http://www.consort-statement.org/about-consort/endorsers1)
34 [statement.org/about-consort/endorsers1](http://www.consort-statement.org/about-consort/endorsers1).
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3 **Fig. 1:** Description of the selection procedure and documentation of the number of
4 published RCTs from dental implantology, the aim being a data pool to identify – per
5 criterion and study – the degree of adherence to the CONSORT recommendations for
6 abstracts. Fifty study reports had to be excluded from further investigation and analysis
7 because the clinical indication (N=1) or the study design (N=39) were not compatible
8 or the respective data sets referred to investigations of animals (N=7), were reviews
9 (N=1) or were not identifiable as RCTs (N=2).
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21 **Fig. 2:** Illustration of the degree of adherence per study (%) in a box plot (N=212).
22 Degree of adherence I (quantitative implementation), degree of adherence II
23 (qualitative implementation).
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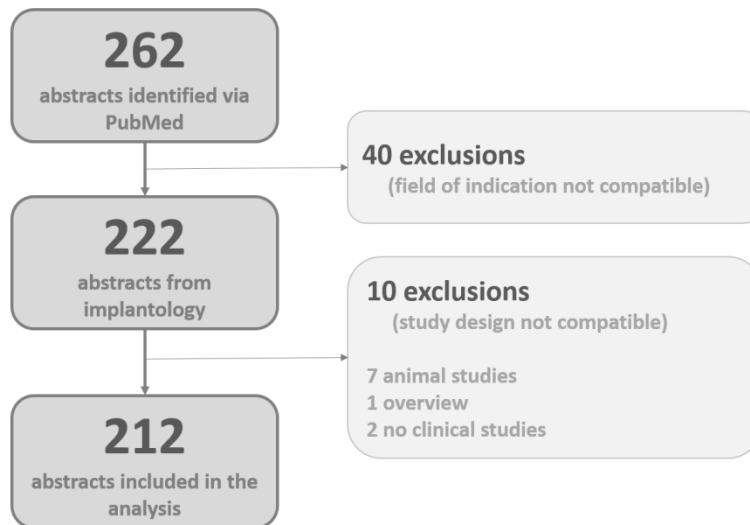
31 **Fig. 3:** Graphical representation of proportional implementation of criteria to facilitate
32 locating the corresponding information in the abstract (degree of adherence I vs.
33 degree of adherence II).
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40 **Supplementary Fig. 1:** Graphical representation of proportional implementation of
41 criteria to facilitate locating the corresponding information in the abstract (degree of
42 adherence I).
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49 **Supplementary Fig. 2:** Illustration of the degree of adherence per study (%) in a box
50 plot (N=212). Degree of adherence I (quantitative implementation), degree of
51 adherence II (qualitative implementation). Evaluation of the reduced data pool with
52 14 criteria (excluded: “registration” and “funding”).
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3 **Supplementary Fig. 3:** Illustration of the degree of adherence per study (%) in a box
4 plot (N=212) as a comparison of data pools with 14 vs. 16 criteria. Degree of
5 adherence I (quantitative implementation), degree of adherence II (qualitative
6 implementation). Evaluation of the reduced data pool was based on 14 criteria
7 (excluded: “registration” and “funding”).
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Description of the selection procedure and documentation of the number of published RCTs from dental implantology, the aim being a data pool to identify – per criterion and study – the degree of adherence to the CONSORT recommendations for abstracts. 50 study reports had to be excluded from further investigation and analysis because the field of indication (N=1) or the study design (N=39) were not compatible, or the respective datasets referred to investigations of animals (N=7), were reviews (N=1) or not identifiable as RCTs (N=2).

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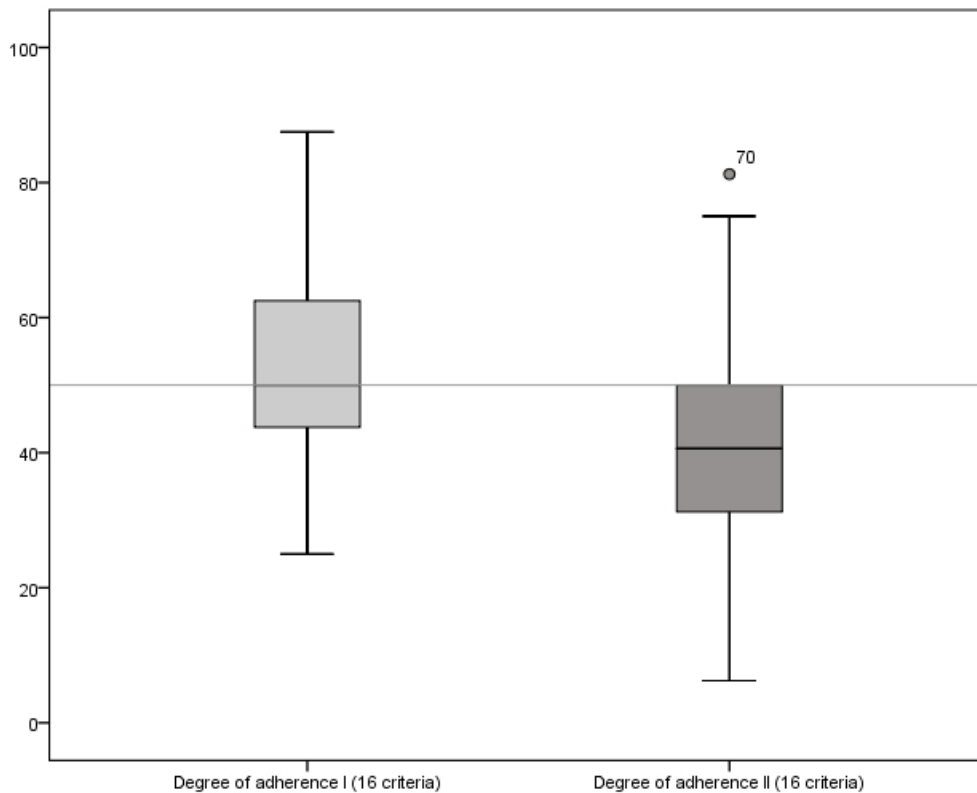
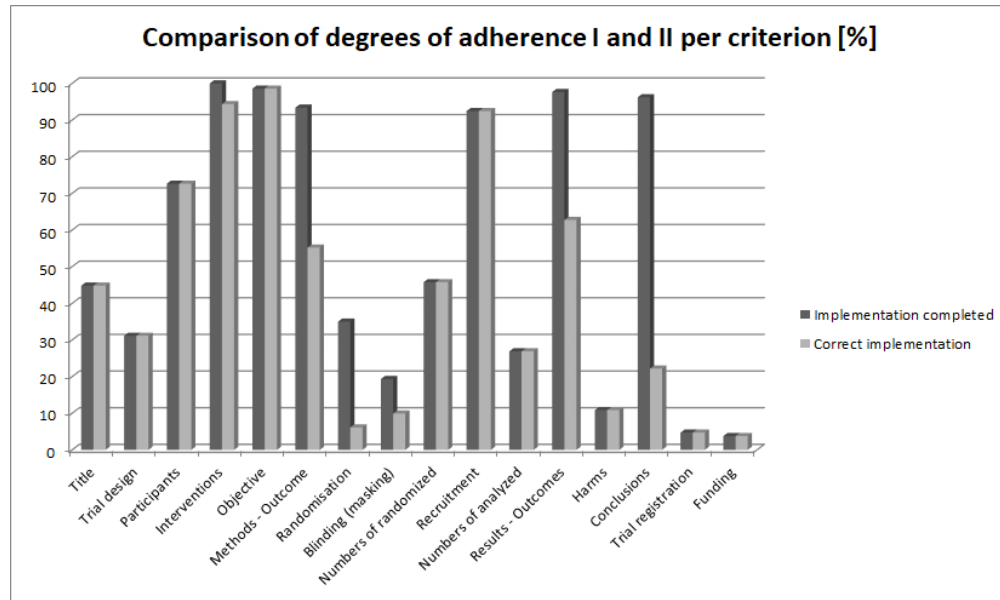


Illustration of degree of adherence per study (%) via box plot (N=212). Degree of adherence I (quantitative implementation), degree of adherence II (qualitative implementation).

220x176mm (72 x 72 DPI)



Graphic display of proportional implementation of criteria to facilitate the location of pertinent information in the abstract (degree of adherence I vs. degree of adherence II).

69x41mm (300 x 300 DPI)

CONSORT criterion	Degree of adherence I	Degree of adherence II
Identification as a randomised trial in the title	Does the title contain “randomised controlled trial” or RCT?	*
Trial design	Description of design in addition to: RCT (randomised, controlled) and Multicentre...	*
Participant characteristics	To document patient characteristics in the abstract, it is not enough to say that patients are suitable for the therapy.	*
Interventions	Intervention indicated	Intervention for each group including dosis indicated
Objective	Specific objective or hypothesis	*
Definition primary endpoint	Documentation of (multiple) endpoints	Clearly defined primary endpoint including measurement variables
Randomisation	Documentation of randomisation ratio in the section Material and Methods	Description of method used to generate the random allocation sequence and implementation in the section Material and Methods
Blinding	Documentation of “blinded” procedure using “masked”, “blinded”, “doubleblind” or similar descriptions	Exact indication of which patient group was blinded
Numbers randomised	Number of patients randomised to each group must be given, or at least total number with randomisation ratio!	*
Recruitment	Dates defining the trial period (trial completed/interim report/trial from ... to ...).	*
Numbers analysed	Number of participants analysed in EACH group	*
Results of outcome	Results reported in section “Results”	Results were reported with reference to the primary endpoint. Effect size and precision are reported for each group.
Harms	General description	*
Conclusion	The abstract contains a conclusion or summary.	The conclusion refers to the research question/results and lists benefits and limitations of the study
Trial registration	Registration number	*
Funding	Source of funding	*

Supplementary table 1: Evaluation basis for CONSORT-A criteria referring to degree of adherence I (information given in the abstract) and degree of adherence II (correct documentation in accordance

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with CONSORT-A). * Variables without formal degree of adherence II. Values from degree of adherence
I are transferred.

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Search	MESH Therms	No. of studies
#8	Search (((("randomized controlled trial"[Publication Type]) AND ("2014"[Date - Publication] : "2016"[Date - Publication])) AND human) AND (((dental implantation) OR dental implant) OR tooth artificial)	262
#7	((dental implantation) OR dental implant) OR tooth artificial	46684
#6	Search dental implantation	21511
#4	Search human	16842581
#2	Search ("2014"[Date - Publication] : "2016"[Date - Publication])	3387284
#1	Search "randomized controlled trial"[Publication Type]	429525

Supplementary table 2: Result from literature research in the electronic database PubMed on March 7, 2017

Journal <i>[journal title abbreviation]</i>	Number <i>[N]</i>	Proportion <i>(%)</i>	5-year IF <i>[as per 2018]</i>	Word count limits <i>[words]</i>
Acta Bioeng Biomech	1	0,5	1,112	150-250
Acta Odontol Scand	3	1,4	1,565	250
Am J Dent	1	0,5	0,720	No limit
Am J Orthod Dentofacial Orthop	2	0,9	1,911	250
Angle Orthod	1	0,5	1,880	250
Ann Anat	2	0,9	2,241	No limit
Biomed Res Int	3	1,4	2,197	300
Br J Oral Maxillofac Surg	2	0,9	1,164	250
Clin Implant Dent Relat Res	22	10,4	3,212	150-200
Clin Oral Implants Res	36	17,0	3,825	250
Compend Contin Educ Dent	1	0,5	0	n.a.
Curr Med Res Opin	1	0,5	2,345	250
Eur J Oral Implantol	36	17,0	2,513	250
Eur J Orthod	1	0,5	1,841	330
Hua Xi Kou Qiang Yi Xue Za Zhi	2	0,9	0	No limit
Int J Oral Maxillofac Surg	7	3,3	1,961	300
Int J Oral Maxillofac Implants	23	10,8	1,734	350
Int J Periodontics Restorative Dent	7	3,3	1,228	75-100
Int J Prosthodont	7	3,3	1,533	350
Implant Dent	5	2,4	1,214	225
J Biomater Appl	1	0,5	2,442	No limit
J Bone Miner Res	1	0,5	5,711	300
J Clin Periodontol	9	4,2	4,164	200
J Craniofac Surg	1	0,5	0,785	200
J Dent	1	0,5	3,280	250
J Dent Res	4	1,9	5,125	300
J Oral Implantol	3	1,4	5,125	250
J Oral Maxillofac Surg	1	0,5	1,781	300
J Oral Rehabil	3	1,4	2,341	250
J Periodontol	4	1,9	2,768	250
J Periodontal Res	1	0,5	2,613	250
J Plast Reconstr Aesthet Surg	1	0,5	2,228	250
J Prosthodont	2	0,9	2,636	350
Med Oral Patol Oral Cir Bucal	3	1,4	1,284	150-300
Oral Maxillofac Surg	1	0,5	1,781	300
Oxid Med Cell Longev	1	0,5	4,868	200
Prog Orthod	1	0,5	1,381	350
Quintessence Int	1	0,5	1,392	250
Saudi Med J	2	0,9	1,055	230
Sci Rep	1	0,5	4,011	200
Stomatologiia	1	0,5	0	250
Swed Dent J	1	0,5	0,818	300

Trials	3	1,4	1,975	350
Vestn Ross Akad Med Nauk	1	0,5	0	300-500
Vojnosanit Pregl	1	0,5	0,272	450
Total	212	100,0		

Supplementary table 3: List of journals [N] (%) from which information was extracted for final analysis, 5-year Impact Factor [2018] and word count limits for each journal as per 2019

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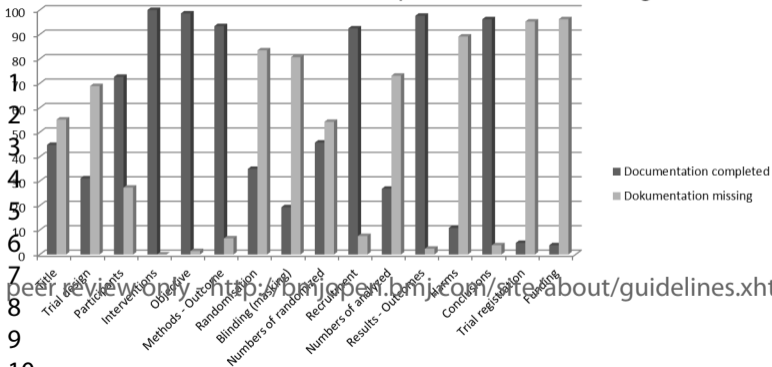
Criterion	Percentage match	Kappa	*Kappa 0.61 – 1.0 (essential match and almost perfect match)
Title	83%	0,677	*
Trial design	89%	0,738	*
Participants	90%	0,744	*
Interventions	100%	n.a.	
Objective	100%	0,798	*
Outcome	91%	0,312	
Randomisation	82%	0,318	
Blinding (masking)	92%	0,726	*
Numbers randomised	76%	0,515	
Recruitment	85%	0,310	
Numbers analysed	84%	0,606	
Outcome	100%	1,000	*
Harms	62%	0,041	
Conclusions	100%	1,000	*
Trial registration	97%	0,449	
Funding	99%	0,762	*

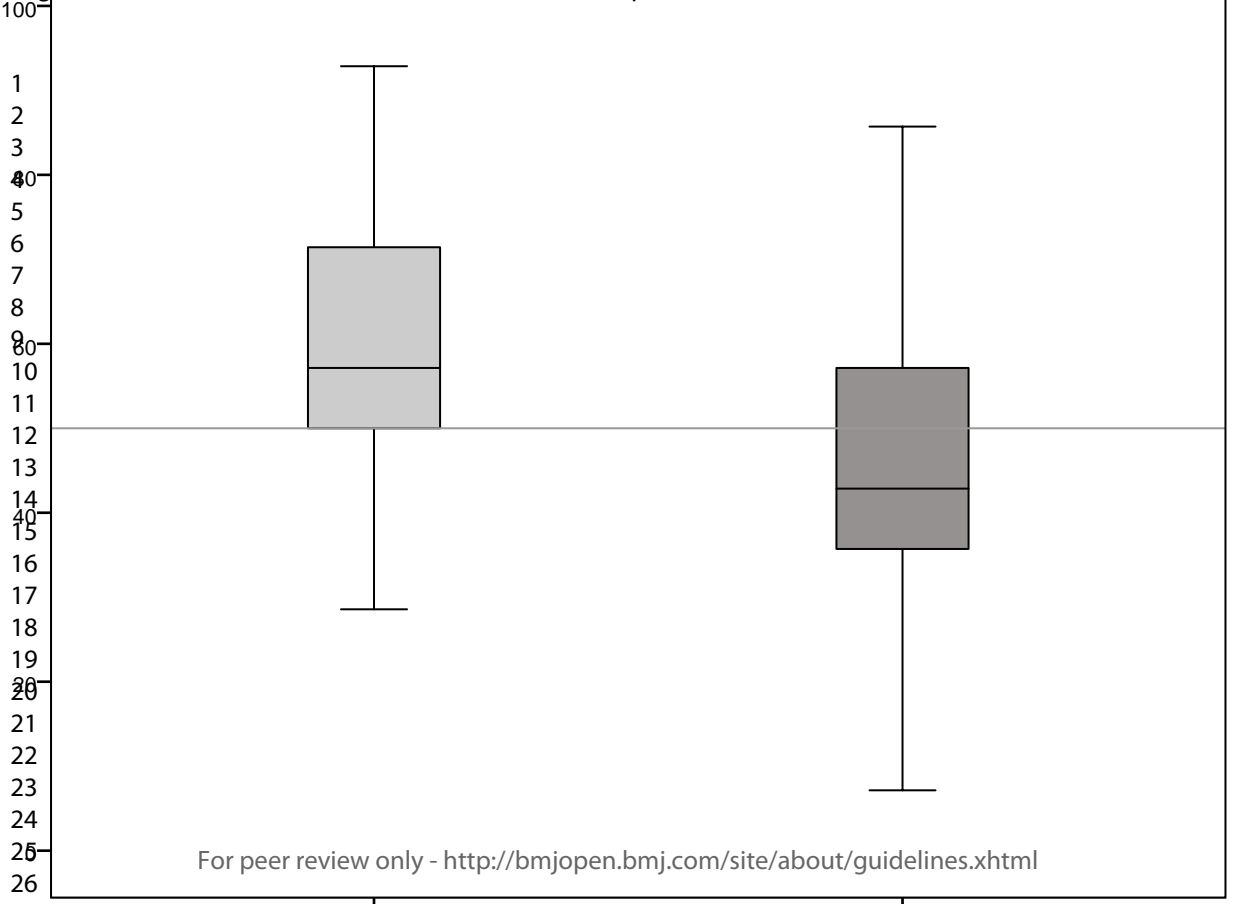
Supplementary table 4: Calculation of Kappa for inter-rater reliability; percentage match between evaluators; Kappa, n.a.= in this case calculation of Kappa was not performed (SPSS) since one evaluator had rated the criterion "intervention" as 1 for all publications; (*) for criteria which showed an essential match or an almost perfect match between evaluators.

Degree of adherence per criterion - degree of adherence I [%]

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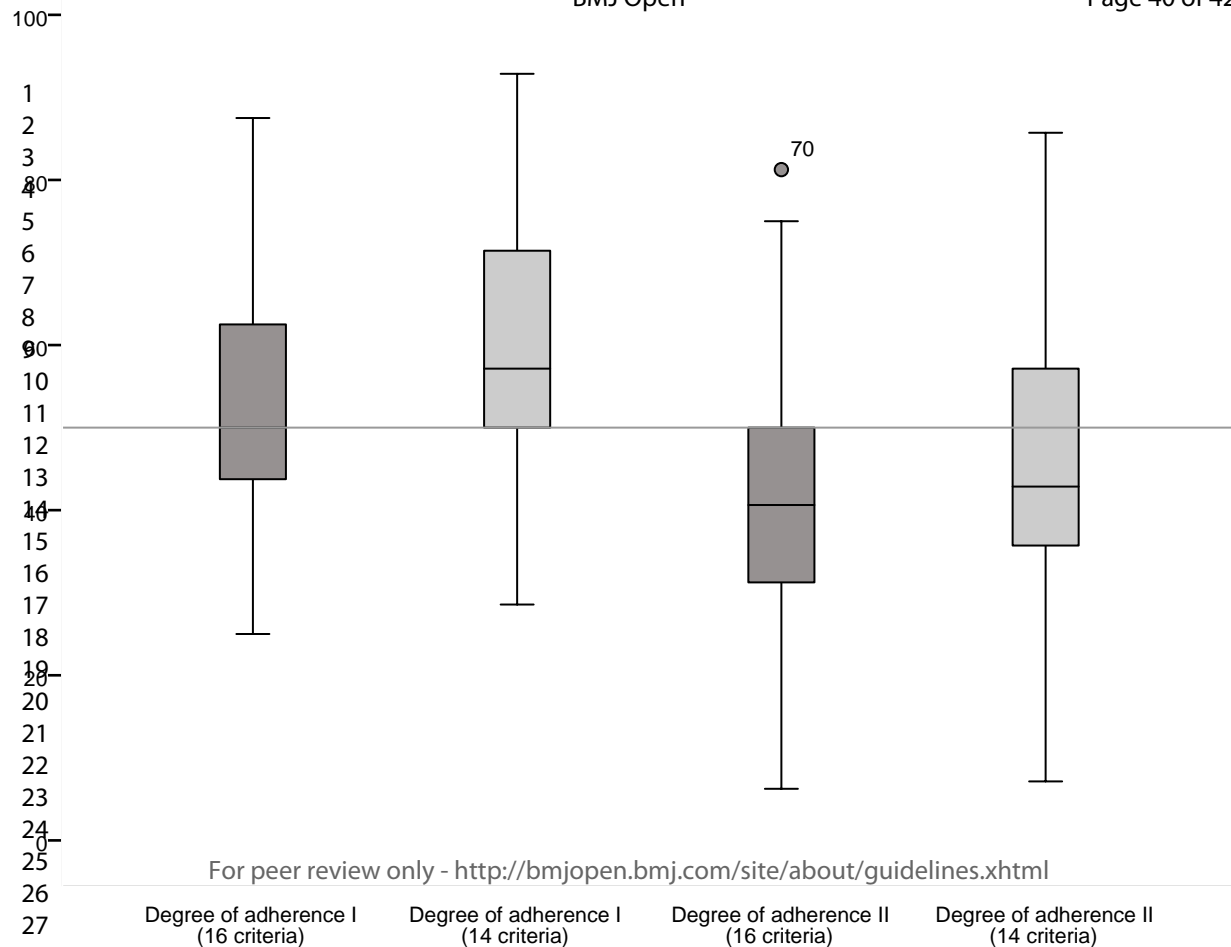




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Degree of adherence I (14 criteria)

Degree of adherence II (14 criteria)





PRISMA 2009 Checklist

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Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	II
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	1-3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	n.a.
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4-5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Supplementary table 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4 Figure 1
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	4
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	3-4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	n.a. -> Assessment of Abstracts
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	4-5



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Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	n.a.
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Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	n.a. -> Assessment of Abstracts
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	5
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Table 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	5-6
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	n.a. -> Assessment of Abstracts
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	n.a. -> Assessment of Abstracts
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	n.a. -> Assessment of Abstracts
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	n.a. -> Assessment of Abstracts
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	8-9
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	12-14
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	11-12
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	15



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FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	III 11

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

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