

### Reporting quality of randomized controlled trials published in prosthodontic and implantology journals

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## Reporting quality of randomized controlled trials published in prosthodontic and implantology journals

**Running head:** Reporting quality of RCTs in prosthodontics and implantology

**Article Category:** Original article

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1 **SUMMARY** The purpose of this study was to examine the reporting quality of randomized controlled  
2 trials (RCTs) published in prosthodontic and implantology journals. Thirty issues of 9 journals in  
3 prosthodontics and implant dentistry were searched for RCTs, covering the years 2005-2012: *The*  
4 *Journal of Prosthetic Dentistry*, *Journal of Oral Rehabilitation*, *The International Journal of*  
5 *Prosthodontics*, *The International Journal of Periodontics & Restorative Dentistry*, *Clinical Oral*  
6 *Implants Research*, *Clinical Implant Dentistry & Related Research*, *The International Journal of Oral*  
7 *& Maxillofacial Implants*, *Implant Dentistry* and *Journal of Dentistry*. The reporting quality was  
8 assessed using a modified CONSORT statement checklist. Data were analyzed using descriptive  
9 statistics followed by univariable and multivariable examination of statistical associations ( $\alpha=0.05$ ). A  
10 total of 147 RCTs were identified with a mean CONSORT score of 69.4 (SD = 9.7). Significant  
11 differences were found among journals with the Journal of Oral Rehabilitation achieving the highest  
12 score (80.6, SD= 5.5) followed by Clinical Oral Implants Research (73.7, SD= 8.3). Involvement of a  
13 statistician/methodologist was significantly associated with increased CONSORT scores. Overall, the  
14 reporting quality of RCTs in major prosthodontic and implantology journals requires improvement.  
15 This is of paramount importance considering that optimal reporting of RCTs is an important  
16 prerequisite for clinical decision-making.

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KEYWORDS: randomized clinical trials, prosthodontics, dental implants

## Introduction

Reliable evidence is more likely consequent to sound design and methodology (1, 2). Among the various study designs the randomized controlled trial (RCT) is considered as the “gold standard” for assessing the effectiveness and safety of medical interventions. Nevertheless, RCTs are also prone to inadequacies and there is a substantial body of evidence in the biomedical literature, which indicates that the quality of many RCTs is suboptimal (3-6).

Accurate and transparent reporting of RCTs is prerequisite for the assessment of their internal validity and the clinical translation of their results (7). In an effort to improve and standardize reporting of RCTs the CONSORT (Consolidated Standards of Reporting Trials) guidelines were developed by the CONSORT group and are continuously being updated. The main CONSORT document consists of 25 items and sets standards on how and what should be included in an RCT report (2).

The CONSORT guidelines have been endorsed by over 580 journals (8) and there is evidence of a positive impact on RCT reporting (9). In dentistry reporting quality of RCTs has been assessed in a number of general and dental specialty journals (10-18), indicating that there is room for improvement. However, there is a lack of studies comparatively evaluating the completeness of reporting of recently published RCTs in prosthodontic and implantology using the CONSORT guidelines (2). Therefore, the primary objective of this study was to evaluate the completeness of reporting of RCTs in prosthodontic and implantology journals using the CONSORT statement. A secondary aim was to identify factors associated with better reporting of RCTs.

## Materials and methods

Four dental journals with emphasis on prosthodontics (*The International Journal of Prosthodontics*, *Journal of Oral Rehabilitation*, *The Journal of Prosthetic Dentistry*, *The International Journal of Periodontics & Restorative Dentistry*), 4 dental implantology journals (*Clinical Implant Dentistry & Related Research*, *Clinical Oral Implants Research*, *Implant Dentistry*, *The International Journal of Oral & Maxillofacial Implants*) and 1 general dental journal with a predilection for prosthodontics (*Journal of Dentistry*) were included in the study. The selected journals had the highest impact factors of prosthodontic and implant dentistry journals based on 2009 data.

The contents of 30 issues of each journal from June 2012 backwards were searched for RCTs on humans. Supplemental issues were included in the search, but were not counted as an issue. Initially the abstract was read and any trials that were clearly RCTs were included. Other articles that used

1 terminology in the title or abstract such as “prospective”, “comparative”, “efficacy” or an indication  
2 was given that a comparison of treatment groups was assessed prospectively, were further investigated  
3 to examine whether randomization was implemented. Studies that did not involve humans and studies,  
4 where it was concluded that no true randomization was implemented, were excluded. Screening and  
5 selection of studies were conducted independently by two authors (DK, SNP).  
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10 The information extracted from each article included journal and year of publication, region  
11 of publication (Europe, Americas or other region, based on the first author), ethical approval, statistical  
12 significance of main finding, number of authors, involvement of a statistician or methodologist, and  
13 whether the study was single- or multicenter. Involvement of a statistician or methodologist was  
14 ascertained by checking author affiliations (public health or epidemiology departments were considered  
15 as providing statistical assistance), author degrees (where provided), and information in the methods or  
16 acknowledgement sections of each paper.  
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24 A modified CONSORT checklist as presented by Tiruvoipati *et al.* (6) was used to evaluate  
25 the reporting completeness of RCTs. This checklist has 30 questions related to the CONSORT items  
26 excluding the first item of the CONSORT checklist (title and abstract), since the authors have to follow  
27 the instructions of the journal in preparing the abstract. The given score per item ranged from 1 to 3,  
28 with 1=no description, 2=inadequate description and 3=adequate description. The scores for the 30  
29 items were added, and a percentage score was calculated for each trial, whereas non- applicable items  
30 were not scored. A trial with adequate descriptions (score 3) for all items would receive a score of 90.  
31 All scores were converted to a percentage scale and therefore a score of 90 was equivalent to 100% in  
32 the percentage scale. When non-applicable items were identified (for example inability to blind the  
33 treatment provider) only the applicable items were considered for the calculation of the percentages.  
34 Therefore, a trial with only 28 applicable items, but adequate descriptions (score 3) for these, would  
35 receive a maximum score of 84, corresponding to a percentage of 100%.  
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46 Each RCT was also scored using the Jadad scale (19), allocating trials a score between zero  
47 (very poor) and five (rigorous). The Jadad scale includes three questions and each one of them is  
48 answered with either yes (1 point) or no (no point): (1) “Is the study described as randomized?”; (2) “Is  
49 the study described as double blinded?”; (3) “Is there a description of withdrawals and dropouts?”. Two  
50 additional points, to reach a maximum score of 5, are given (i) if the method of randomization is clearly  
51 described and appropriate or (ii) if the method of blinding is clearly described and appropriate. One or  
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1 two points are subtracted if the method of randomization or the method of blinding is described, but is  
2 inappropriate.  
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5 Each included RCT was scored independently by 2 authors (DK, SNP), and subsequently  
6 results were compared and modified in order to arrive to a mutually agreed score. Discrepancies  
7 between the 2 authors (DK, SNP) were resolved by discussion. Before data extraction, a calibration  
8 exercise was performed between the two authors responsible for it (DK, SNP) with 80 randomly  
9 selected studies. Inter-rater agreement was evaluated for all extracted data with Cohen's kappa and any  
10 disagreements were resolved with discussion.  
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### 17 *Statistical Analysis*

18 Descriptive statistics were calculated for the modified CONSORT scores and tabulated by trial  
19 characteristics. The modified CONSORT scores were approximately normally distributed. Data were  
20 analyzed through linear regression modeling; univariable analysis was utilized to determine articles'  
21 characteristics associated with the modified CONSORT scores, whereas multivariable analysis was  
22 employed to adjust for possible confounders. A two-tailed P-value of 0.05 was considered statistically  
23 significant with a 95% confidence interval. Analyses were performed with the STATA® version 13.0  
24 software (Stata Corporation, College Station, Texas, USA).  
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### 35 **Results**

36 From the 3667 articles that were originally screened 3520 were excluded for not adhering to the  
37 inclusion criteria, leaving 147 RCTs for detailed assessment (Appendix 1). Inter-rater agreement was  
38 found to be excellent (kappa 0.88, 95% CI: 0.87-0.89). The included RCTs reported on a wide selection  
39 of topics ranging from surgical implant procedures and techniques, survival of implants and prostheses,  
40 biological responses, clinician's perspective of esthetics and patient satisfaction.  
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46 Table 1 displays the 147 RCTs tabulated by their characteristics. The journals contributing  
47 with the most RCTs were *Clinical Oral Implants Research* (31.3%), followed by *The International*  
48 *Journal of Oral and Maxillofacial Implants* (16.3%) and *Journal of Dentistry* (14.3%). The majority of  
49 RCTs originated from Europe (58.5%), were approved by an ethical committee (72.1%) and reported  
50 statistically significant findings (59.2%). Concerning the number of authors, most RCTs included four  
51 to six authors (64.6 %), whereas a statistician/methodologist was involved in 37.4% of the RCTs.  
52 Finally, the majority of RCTs were a multi-center effort (71.4 %).  
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Table 2 displays the scores for all items on the modified CONSORT checklist. Description of pre-study sample size calculation was absent in the majority of the trials (64.0%). No description of the random number generation was also evident in 32.7% of the trials. Allocation concealment was not reported in 61.9% of the studies, whereas details of personnel involved in sequence allocation, enrollment, and assignment were not described in 51.0% of those. Blinding of participants and treatment providers was not reported in 36.7% and 37.4% of the sample respectively. No description of blinding of assessors and analysts reached 61.9% and 89.8% respectively. Absence of a flow chart describing patient numbers at different stages of a study was apparent in 76.9% of the sample. Trial limitations and generalizability of the trial results were not reported in 55.8% and 52.4 % of the studies respectively.

The modified CONSORT scores per study characteristic are presented in Table 3. The highest modified CONSORT score was found for the *Journal of Oral Rehabilitation* (80.6%), which, however, contributed only 2 RCTs, followed by the *Clinical Oral Implants Research* (73.7%). The highest modified CONSORT scores chronologically were found in the years 2010-2011. Increased CONSORT scores were also found for RCTs with ethical approval and RCTs with involvement of a statistician/methodologist.

Table 4 presents the results of the univariable and multivariable linear regression analyses. In the univariable analysis, the journal of publication and the involvement of a statistician/methodologist were significantly associated with the CONSORT scores. Similar associations were observed in the multivariable analysis.

Table 5 displays the Jadad scores for the 147 RCTs tabulated by journal. The median Jadad scores ranged from 1.0 (*Journal of Prosthetic Dentistry*) to 3.5 (*Implant Dentistry*).

## Discussion

In this study the reporting quality of RCTs in the fields of prosthodontics and implant dentistry was assessed using a modified CONSORT statement (6) and the Jadad scale (19). The mean modified CONSORT scores ranged from 60.9% to 80.6 % among the journals included in the study, a finding similar to the scores reported in medical journals (6,20). The Jadad score ranged from 1.0 to 3.5; this finding is comparable to other fields in medicine (6). Although all quality score scales have inherent limitations and caution should be used when evaluating reporting quality, the overall score indicates that there is room for improvement.

Pre-study sample size calculation is an important part of designing a trial, and guards against underpowered trials that may result in waste (21-24). In the present study 64.0% of the RCTs did not report sample size calculation at all, while, 8.2% of them reported it inadequately. Chan and Altman (25) reported that 73% of the 519 medical trials published in PubMed in December 2000 did not report sample size calculation. It seems that problematic reporting of pre-study sample size calculations in RCTs is a common finding in the literature (11, 14, 26-30). **Trials with insufficient sample size can be considered unethical, wasteful (21-24) and less credible compared to trials of sufficient size.**

The reporting of the randomization process should, ideally, include details about both the methods used to generate the random allocation sequence and any restrictions used during the process. Terms such as “patients were randomly assigned” or “two groups were formed at random” are considered inadequate. The current study showed that the generation of the unpredictable allocation sequence was reported inadequately in 11.6% of the cases or not at all in 32.7% of the cases. Altman and Dore (31) studied 80 medical trials published in four leading medical journals and concluded that in 30% of trials there was no clear evidence that the groups had been randomised.

In dentistry, Montenegro *et al.* (15) found that only 17% of the trials published in periodontal journals reported the randomization process adequately. Koletsi *et al.* (32) found that from 112 clinical trials in the orthodontic literature labeled as RCTs, only 29.5% were indeed identified as RCTs based on clear descriptions of appropriate random number generation.

Allocation concealment ensures that neither the investigators nor the patients know which treatment the next patient will be allocated to and guards against confounding. Although allocation concealment is always feasible, the results showed that 61.9% of the included RCTs did not report allocation concealment at all, while 17.7% of them reported it inadequately. These results are in accordance with previous studies; Pandis *et al.* (18) reported 22% adequacy in reporting allocation



1 concealment among dental journals and Montenegro *et al.* (15) only 7% among three periodontal  
2 journals.  
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5 Another key element in RCT reporting is the description of blinding. Blinding is important to  
6 the validity of a trial, as it prevents performance and detection bias, and protects the sequence after  
7 allocation. Often the concepts of allocation concealment and blinding are confused. Blinding is  
8 especially important for subjective outcomes (e.g. pain scores), as these are more prone to bias.  
9 Blinding of the patients and the treatment providers may not always be possible, however, blinding of  
10 the assessors and the analysts is (33, 34). The results of this study showed that blinding of the various  
11 groups was not reported at all in 36.7% to 89.8% of the cases. Pandis *et al.* (18) using a similar scale  
12 reported adequate description of blinding in RCTs published in leading dental journals in the range of  
13 0 to 26%.  
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22 Statistical methods used for data analysis were not described in 6.1% whereas 59.2% of the  
23 RCT reports provided an adequate description. These results are similar to a previous assessment in  
24 dentistry, which reported that 3% of the studies provided no description and 51% provided adequate  
25 description of statistical methods (18). Analyses should be pre-specified and ideally described in the  
26 trial protocol. Pre-specification allows for the assessment of selective reporting and data driven  
27 analysis which can be misleading. A common statistical pitfall is the conduct of multiple tests, which  
28 leads to increased type I error (false positive) that can be misleading when associated with selective  
29 reporting. It is recommended that subgroup analyses should be pre-specified and kept to the minimum  
30 (35, 36). The results of the present study showed that 30.6% of the trials did not describe how this  
31 issue was handled, while 34.0% of the reports described it adequately. Pocock *et al.* (37) studied 45  
32 medical trials published in three high impact factor medical journals and they reported that multiple  
33 endpoints were analyzed without being pre-specified as primary endpoints.  
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44 Finally, in the present study 6.1% and 80.2% of the trials lacked complete description of  
45 estimates and confidence intervals, respectively. Previous studies found inadequate results' reporting  
46 in leading medical journals (37). Pandis *et al.* (18) found that dental trials also suffered from  
47 problematic reporting in this area of interest, with lack of description in 3% and 80% of the studied  
48 trials and adequate description in 62% and 20% of them for the complete reporting of the results and  
49 for the reporting of confidence intervals respectively. Reporting of estimates and confidence intervals  
50 facilitates interpretation in relation to clinical importance. P-values and statistical significance are  
51 based on arbitrary cut-off points (i.e. 0.05) and are sensitive to sample size and variance. Small P-  
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1 values are often misinterpreted as showing a clinically important effect and vice versa as trivial and  
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3 clinically unimportant differences can be statistically significant when sample size is large and  
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5 variance is small (38).  
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7 This study is not free of limitations. A limitation might be that the scoring of trials is always  
8 susceptible to some degree of subjectivity. Nevertheless, considerable efforts were made to  
9 compensate for inter-rater subjectivity by calibration exercises before study commencement and strict  
10 adherence to applied CONSORT guidelines. RCT assessment was limited to high impact factor  
11 prosthetic journals and therefore published RCTs in lower impact factor journals or even non-  
12 published RCTs were excluded. However, we believe that the selected journals constitute a  
13 representative or best case scenario sample of the reporting status in the specialty. It should be, also,  
14 underlined that incomplete reporting of trials does not necessarily infer low quality of conducting or  
15 false methodology (39). Researchers might have designed and conducted a study ideally, but they  
16 might have omitted reporting accurately all stages and aspects of their trial due to, for instance, space  
17 limitations. Even though RCTs are pivotal for evidence-based dentistry and medicine, they are not free  
18 of shortcomings. It is important that they are designed properly, implemented and reported well.  
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29 Numerous journals have adopted the CONSORT guidelines and very few have implemented  
30 active compliance. The American Journal of Orthodontics and Dentofacial Orthopedics, for instance,  
31 has recently implemented a novel approach which includes assessment of compliance at the editorial  
32 level and specific recommendations for the authors in order to improve RCT reporting. A preliminary  
33 study indicated that this approach has increased dramatically reporting quality (40). In addition the  
34 journal has recently adopted a structured report which diverges from the standard IMRaD  
35 (Introduction, Methods, Results, Discussion) structure and includes 17 subheadings that lead the report  
36 (41). Similar initiatives have been proposed elsewhere (42). The results of the present study indicate  
37 that adherence to the CONSORT statement of RCTs in major prosthodontic and implantology journals  
38 can be improved.  
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### 50 Conflict of interest

51 No funding was obtained for the current study. No conflict of interest declared.  
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**Tables****Table 1.** Characteristics of the 147 included randomized controlled trials

Characteristic	Category	N	%
Journal	Clin Implant Dent Relat Res	13	8.8
	Clin Oral Implants Res	46	31.3
	Implant Dent	4	2.7
	Int J Oral Maxillofac Implants	24	16.3
	Int J Periodontics Restor Dent	15	10.2
	Int J Prosthodont	20	13.6
	J Dent	21	14.3
	J Oral Rehabil	2	1.4
Year	J Prosthet Dent	2	1.4
	2007	4	2.7
	2008	12	8.2
	2009	13	8.8
	2010	41	27.9
	2011	42	28.6
Continent	2012	35	23.8
	Europe	86	58.5
	Americas	30	20.4
Ethics committee approval	Asia/Other	31	21.1
	No	41	27.9
Statistical significance of main finding	Yes	106	72.1
	No	60	40.8
Number of authors	Yes	87	59.2
	<4	35	23.8
	4- 6	60	40.8
Statistician/methodologist involvement	6≤	52	35.4
	No	92	62.6
Number of centers	Yes	55	37.4
	Single-center	42	28.6
	Multicenter	105	71.4

**Table 2.** Distribution of consensus scores for the items in the modified CONSORT checklist (n=147)

Item	No description – n (%)	Inadequate – n (%)	Adequate – n (%)
1. Justification for the trial for the trial	15 (10.2)	16 (10.9)	116 (78.9)
2. Explicit definition of eligibility criteria	9 (6.1)	26 (17.7)	112 (76.2)
3. Detailed description of setting/location of recruitment and data collection	21 (14.3)	27 (18.4)	99 (67.3)
4. Details of intervention studied	0 (0.0)	14 (9.5)	133 (90.5)
5. Clear statement of hypothesis or objectives	2 (1.4)	29 (19.7)	116 (78.9)
6. Identification and definition of outcome measures	2 (1.4)	24 (16.3)	121 (82.3)
7. Description of pre-study sample size calculation	94 (63.9)	12 (8.2)	41 (27.9)
8. Description of the generation of unpredictable allocation sequence	48 (32.7)	17 (11.6)	82 (55.8)
9. Details of any restriction used in randomization	85 (57.8)	13 (8.8)	49 (33.3)
10. Description of allocation concealment	91 (61.9)	26 (17.7)	30 (20.4)
11. Details of personnel involved in sequence allocation, enrollment, and assignment	75 (51.0)	35 (23.8)	37 (25.2)
12. Details of blinding of participants	54 (36.7)	9 (6.1)	84 (57.1)
13. Details of blinding of treatment providers	55 (37.4)	4 (2.7)	88 (59.9)
14. Details of blinding of assessors	91 (61.9)	18 (12.2)	38 (25.9)
15. Details of blinding of analysts	132 (89.8)	6 (4.1)	9 (6.1)
16. Details of measurement of success of blinding	143 (97.3)	1 (0.7)	3 (2.0)
17. Description of statistical methods	9 (6.1)	51 (34.7)	87 (59.2)
18. Flow chart describing patient numbers at different stages	113 (76.9)	6 (4.1)	28 (19.1)
19. Clear description of protocol deviations	55 (37.4)	19 (12.9)	73 (49.7)
20. Description of dates of recruitment	89 (60.5)	8 (5.4)	50 (34.0)
21. Details of follow-up	12 (8.2)	17 (11.6)	118 (80.3)
22. Description of baseline characteristics	19 (12.9)	64 (43.5)	64 (43.5)
23. Reporting of intention-to-treat principle	135 (91.8)	3 (2.0)	9 (6.1)
24. Complete reporting of results	9 (6.1)	16 (10.9)	122 (83.0)
25. Reporting of confidence intervals	118 (80.3)	2 (1.4)	27 (18.4)
26. Multiple testing and corrections	45 (30.6)	52 (35.4)	50 (34.0)
27. Description of side effects/adverse effects	33 (22.5)	19 (12.9)	95 (64.6)
28. Trial limitations and weaknesses	82 (55.8)	31 (21.1)	34 (23.1)
29. External validity of trial results	77 (52.4)	49 (33.3)	21 (14.3)
30. Literature review	1 (0.7)	9 (6.1)	137 (93.2)

**Table 3.** Modified CONSORT scores of the 147 included randomized controlled trials

Characteristic	Category (N)	Mean	SD
Journal	Clin Implant Dent Rel Res (n=13)	64.1	5.8
	Clin Oral Implants Res (n=46)	73.7	8.3
	Implant Dent (n=4)	65.8	4.5
	Int J Oral Maxillofac Implants (n=24)	71.0	10.6
	Int J Periodontics Restor Dent (n=15)	60.9	9.3
	Int J Prosthodont (n=20)	68.0	10.9
	J Dent (n=21)	69.3	7.5
	J Oral Rehabil (n=2)	80.6	5.5
Year	J Prosthet Dent (n=2)	62.2	12.6
	2007 (n=4)	70.0	11.4
	2008 (n=12)	64.8	10.1
	2009 (n=13)	67.0	11.9
	2010 (n=41)	70.5	10.0
	2011 (n=42)	70.5	8.6
Country	2012 (n=35)	69.1	9.5
	Europa (n=86)	69.6	10.1
	Americas (n=30)	69.8	8.8
Ethics committee approval	Asia/Other (n=31)	68.4	9.6
	No (n=41)	67.5	10.0
Statistical significance of main finding	Yes (n=106)	70.1	9.5
	No (n=41)	70.1	9.7
Number of authors	Yes (n=106)	68.9	9.7
	<4 (n=35)	70.4	9.8
	4≤n< 6 (n=60)	68.9	10.0
Statistician/methodologist involvement	≤6 (n=52)	69.2	9.4
	No (n=92)	68.4	8.3
Number of centers	Yes (n=55)	71.1	11.5
	Single-center (n=42)	68.3	9.1
	Multicenter (n=105)	69.8	9.9
	Total (n=147)	69.4	9.7

SD, standard deviation.

**Table 4.** Univariable and multivariable linear regression-derived coefficients ( $\beta$ ) and 95% Confidence Intervals (CIs) for modified CONSORT score as dependent variable for the 147 included randomized controlled trials

		Univariable analysis			Multivariable analysis		
		$\beta$	95% CI	P	$\beta$	95% CI	P
Journal							
	Clin Implant Dent Relat Res	3.21	(-3.53,9.95)	0.35	2.75	(-3.96,9.46)	0.42
	Clin Oral Implants Res	12.76	(7.47,18.05)	<0.001	12.42	(7.08,17.76)	<0.001
	Other	7.72	(-0.06,15.51)	0.05	8.37	(0.62,16.11)	0.04
	Int J Oral Maxillofac Implants	10.08	(4.23,15.94)	0.001	10.21	(4.27,16.15)	0.001
	Int J Prosthodont	7.11	(1.04,13.19)	0.02	6.37	(0.28,12.46)	0.04
	J Dent	8.26	(2.25,14.28)	<0.01	8.21	(2.12,14.32)	<0.01
Year		0.64	(-0.57,1.85)	0.30	0.55	(-0.66,1.75)	0.37
Country							
	Europe	1.21	(-2.82,5.25)	0.55			
	America	1.39	(-3.54,6.32)	0.56			
	Asia/Other	Baseline (reference)					
Ethics committee approval							
	No	Baseline (reference)					
	Yes	2.56	(-0.95,6.07)	0.15	0.42	(-3.02,3.86)	0.81
Statistical significance of main finding							
	No	1.17	(-2.05,4.39)	0.47			
	Yes	Baseline (reference)					
Number of authors							
	<4	1.44	(-2.66,5.53)	0.49			
	4-6	Baseline (reference)					
	6 $\leq$	0.26	(-3.38,3.91)	0.87			
Statistician/methodologist involvement							
	No	Baseline (reference)					
	Yes	2.77	(-0.48,6.01)	0.09	3.44	(0.29,6.59)	0.03
Number of centers							
	Single-center	Baseline (reference)					
	Multicenter	1.54	(-1.96,5.04)	0.39			

**Table 5.** Descriptive statistics for the Jadad score of the 147 included RCTs by journal

Journal (n)	Median	IQR
Clin Implant Dent Relat Res (n=13)	3.0	1.0
Clin Oral Implants Res (n=46)	3.0	1.0
Implant Dent (n=4)	3.5	2.0
Int J Oral Maxillofac Implants (n=24)	3.0	2.0
Int J Periodontics Restor Dent (n=15)	2.0	1.0
Int J Prosthodont (n=20)	2.0	1.0
J Dent (n=21)	3.0	0.0
J Oral Rehabil (n=2)	3.0	2.0
J Prosthet Dent (n=2)	1.0	2.0

IQR, interquartile range (Q3-Q1).

For Peer Review

## Appendix 1. List of scored papers

ID	Year	Journal	Year	Issue(volume)	First Author	Jadad	CONSORT	CONSORT %
18	2012	Clin Oral Implants Res	2012	23(5)	Sisti A	4	67	74.4
22	2012	Clin Oral Implants Res	2012	23(5)	Canullo L	4	58	64.4
30	2012	Clin Oral Implants Res	2012	23(5)	Van Assche N	3	66	73.3
31	2012	Clin Oral Implants Res	2012	23(5)	Quirynen M	3	65	72.2
32	2012	Clin Oral Implants Res	2012	23(5)	Chongcharoen N	3	66	73.3
38	2012	Clin Oral Implants Res	2012	23(4)	Trombelli L	5	69	76.7
46	2012	Clin Oral Implants Res	2012	23(4)	Krennmair G	2	60	66.7
47	2012	Clin Oral Implants Res	2012	23(4)	Romano M	5	61	67.8
48	2012	Clin Oral Implants Res	2012	23(4)	Elsyad M	3	73	81.1
58	2012	Clin Oral Implants Res	2012	23(3)	Lorenzo R	5	83	92.2
78	2012	Clin Oral Implants Res	2012	23(2)	Hammerle C	5	76	84.4
79	2012	Clin Oral Implants Res	2012	23(2)	Urban T	3	63	70.0
143	2011	Clin Oral Implants Res	2011	22(11)	den Hartog L	5	75	83.3
155	2011	Clin Oral Implants Res	2011	22(10)	Cordaro L	3	70	77.8
162	2011	Clin Oral Implants Res	2011	22(10)	Enkling N	3	67	74.4
173	2011	Clin Oral Implants Res	2011	22(8)	Karabuda Z	3	71	78.9
175	2011	Clin Oral Implants Res	2011	22(8)	Galindo-Moreno P	3	58	64.4
182	2011	Clin Oral Implants Res	2011	22(7)	Sakalioglu U	2	54	60.0
193	2011	Clin Oral Implants Res	2011	22(6)	van Brakel	2	61	67.8
201	2011	Clin Oral Implants Res	2011	22(6)	Nissan J	2	54	60.0
202	2011	Clin Oral Implants Res	2011	22(6)	Bressan E	1	55	61.1
209	2011	Clin Oral Implants Res	2011	22(5)	Jokstad A	5	80	88.9
211	2011	Clin Oral Implants Res	2011	22(5)	Chackartchi T	3	63	70.0
222	2011	Clin Oral Implants Res	2011	22(5)	Heberer S	3	58	64.4
234	2011	Clin Oral Implants Res	2011	22(4)	Mardas N	4	79	87.8
239	2011	Clin Oral Implants Res	2011	22(3)	Heitz-Mayfield L	5	69	76.7
241	2011	Clin Oral Implants Res	2011	22(3)	Rickert D	4	65	72.2
252	2011	Clin Oral Implants Res	2011	22(3)	Alsabeeha N	3	74	82.2
272	2011	Clin Oral Implants Res	2011	22(1)	Tan W	3	64	71.1
278	2011	Clin Oral Implants Res	2011	22(1)	Galucci G	4	70	77.8
298	2010	Clin Oral Implants Res	2010	21(12)	Felice P	5	81	90.0
302	2010	Clin Oral Implants Res	2010	21(11)	Van Der Bilt A	1	53	58.9
304	2010	Clin Oral Implants Res	2010	21(11)	Van de Velde T	3	66	73.3
309	2010	Clin Oral Implants Res	2010	21(11)	Urban T	3	61	67.8
313	2010	Clin Oral Implants Res	2010	21(11)	Koch F	3	64	71.1
318	2010	Clin Oral Implants Res	2010	21(9)	Pineiro A	2	59	65.6



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2	343	2010	Clin Oral Implants Res	2010	21(7)	Degidi M	5	73	81.1
3	344	2010	Clin Oral Implants Res	2010	21(7)	Mardas N	4	72	80.0
4	373	2010	Clin Oral Implants Res	2010	21(5)	Elsyad M	3	68	75.6
5	374	2010	Clin Oral Implants Res	2010	21(5)	Zembic A	4	69	76.7
6	377	2010	Clin Oral Implants Res	2010	21(5)	Thone-Muhling M	3	59	65.6
7	381	2010	Clin Oral Implants Res	2010	21(5)	Pelegrine A	2	60	66.7
8	426	2010	Clin Oral Implants Res	2010	21(2)	Park J-C	4	76	84.4
9	428	2010	Clin Oral Implants Res	2010	21(2)	Jofre J	2	64	71.1
10	431	2010	Clin Oral Implants Res	2010	21(1)	Sanz M	3	69	76.7
11	444	2010	Clin Oral Implants Res	2010	21(1)	Canullo L	4	61	67.8
12	467	2012	Clin Implant Dent Relat Res	2012	14(s1)	Al-Zubeidi M	2	59	65.6
13	503	2012	Clin Implant Dent Relat Res	2012	14(2)	Enkling N	3	49	54.4
14	509	2012	Clin Implant Dent Relat Res	2012	14(1)	Lindgren C	2	58	64.4
15	515	2012	Clin Implant Dent Relat Res	2012	14(1)	Ortorp A	1	61	67.8
16	521	2012	Clin Implant Dent Relat Res	2012	14(1)	Enkling N	2	50	55.6
17	534	2011	Clin Implant Dent Relat Res	2011	13(3)	Wenneberg A	4	69	76.7
18	550	2011	Clin Implant Dent Relat Res	2011	13(2)	Visser A	3	61	67.8
19	586	2010	Clin Implant Dent Relat Res	2010	12(2)	Cehreli M	4	53	58.9
20	597	2010	Clin Implant Dent Relat Res	2010	12(1)s	Turkyilmaz I	3	60	66.7
21	634	2009	Clin Implant Dent Relat Res	2009	11(3)	Mericske-Stern R	2	60	66.7
22	649	2009	Clin Implant Dent Relat Res	2009	11(1)s	Canullo L	3	59	65.6
23	695	2008	Clin Implant Dent Relat Res	2008	10(1)	Guncu G	3	55	61.1
24	726	2007	Clin Implant Dent Relat Res	2007	9(1)	Hall J	3	56	62.2
25	819	2012	Int J Oral Maxillofac Implants	2012	27(2)	Wohlfahrt J	4	70	77.8
26	823	2012	Int J Oral Maxillofac Implants	2012	27(2)	Ramel C	4	63	70.0
27	873	2011	Int J Oral Maxillofac Implants	2011	26(6)	Taguchi T	2	55	61.1
28	946	2011	Int J Oral Maxillofac Implants	2011	26(3)	Krennmair G	1	47	52.2
29	948	2011	Int J Oral Maxillofac Implants	2011	26(3)	Canullo L	4	67	74.4
30	949	2011	Int J Oral Maxillofac Implants	2011	26(3)	Fung K	4	66	73.3
31	972	2011	Int J Oral Maxillofac Implants	2011	26(2)	Heberer S	2	53	58.9
32	975	2011	Int J Oral Maxillofac Implants	2011	26(2)	De Kok I	2	62	68.9
33	989	2011	Int J Oral Maxillofac Implants	2011	26(1)	Salihoglu U	2	55	61.1
34	998	2011	Int J Oral Maxillofac Implants	2011	26(1)	Pieri F	5	71	78.9
35	102	2010	Int J Oral Maxillofac Implants	2010	25(6)	Jofre J	4	65	72.2
36	107	2010	Int J Oral Maxillofac Implants	2010	25(4)	Merli M	5	85	94.4
37	109	2010	Int J Oral Maxillofac Implants	2010	25(3)	van Kesteren C	2	60	66.7
38	121	2009	Int J Oral Maxillofac Implants	2009	24(5)	Aimetti M	3	63	70.0
39	127	2009	Int J Oral Maxillofac Implants	2009	24(2)	Prosper L	5	80	88.9
40	133	2009	Int J Oral Maxillofac Implants	2009	23(5)	Covani U	3	58	64.4
41									
42									
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2	133	200	Int J Oral Maxillofac Implants	200	23(5)	Cannizzaro G	5	79	87.8
3	9	8		8					
4	134	200	Int J Oral Maxillofac Implants	200	23(5)	Shahidi P	3	60	66.7
5	7	8		8					
6	137	200	Int J Oral Maxillofac Implants	200	23(4)	Schropp L	3	56	62.2
7	3	8		8					
8	137	200	Int J Oral Maxillofac Implants	200	23(4)	Crespi R	2	57	63.3
9	5	8		8					
10	138	200	Int J Oral Maxillofac Implants	200	23(3)	Schincaglia G	3	69	76.7
11	7	8		8					
12	140	200	Int J Oral Maxillofac Implants	200	23(2)	Morneburg T	2	57	63.3
13	8	8		8					
14	146	200	Int J Oral Maxillofac Implants	200	22(5)	Oates T	2	57	63.3
15	9	7		7					
16	147	200	Int J Oral Maxillofac Implants	200	22(5)	Testori T	5	78	86.7
17	8	7		7					
18	151	201	Implant Dent	201	21(3)	Gadallah A	5	65	72.2
19	5	2		2					
20	154	201	Implant Dent	201	21(3)	Gadallah A	4	56	62.2
21	7	2		2					
22	171	201	Implant Dent	201	19(2)	Basha A	2	57	63.3
23	9	0		0					
24	179	200	Implant Dent	200	18(1)	Guncu G	3	59	65.6
25	9	9		9					
26	191	201	J Dent	201	40(5)	de Sousa Barbosa R	2	54	60.0
27	8	2		2					
28	196	201	J Dent	201	40(1)	West N	4	79	87.8
29	7	2		2					
30	198	201	J Dent	201	39(s3)	Moffa E	3	58	64.4
31	0	1		1					
32	200	201	J Dent	201	39(11)	Lopez-Jomet M	3	60	66.7
33	4	1		1					
34	200	201	J Dent	201	39(11)	Kitasako Y	4	65	72.2
35	6	1		1					
36	201	201	J Dent	201	39(10)	Ren Y-F	3	58	64.4
37	5	1		1					
38	203	201	J Dent	201	39(7)	Huth K	4	69	76.7
39	8	1		1					
40	204	201	J Dent	201	39(7)	Nelson-Filho P	3	63	70.0
41	2	1		1					
42	204	201	J Dent	201	39(7)	Shen P	3	70	77.8
43	3	1		1					
44	205	201	J Dent	201	39(5)	Wirsching E	2	53	58.9
45	6	1		1					
46	211	201	J Dent	201	38(12)	Meireles S	5	70	77.8
47	4	0		0					
48	212	201	J Dent	201	38(12)	Huth K	3	67	74.4
49	2	0		0					
50	212	201	J Dent	201	38(11)	Hyde T	5	66	73.3
51	5	0		0					
52	213	201	J Dent	201	38(11)	Pan S	3	62	68.9
53	1	0		0					
54	217	201	J Dent	201	38(7)	Syrek A	3	54	60.0
55	3	0		0					
56	218	201	J Dent	201	38(6)	dos Santos M	3	64	71.1
57	1	0		0					
58	218	201	J Dent	201	38(6)	Banerjee A	3	58	64.4
59	4	0		0					
60	218	201	J Dent	201	38(6)	Mcdonald E	3	58	64.4
61	9	0		0					
62	221	201	J Dent	201	38(3)	Emami E	2	64	71.1
63	9	0		0					
64	225	201	J Dent	201	38s3	Mason S	3	52	57.8
65	2	0		0					
66	225	201	J Dent	201	38s3	Maggio B	2	63	70.0
67	3	0		0					
68	235	201	J Prosthet Dent	201	106(1)	Burns D	2	64	71.1
69	2	1		1					
70	242	201	J Prosthet Dent	201	104(6)	Damodara E	0	48	53.3
71	4	0		0					
72	261	201	J Oral Rehab	201	38(10)	Nilsson H	2	69	76.7
73	6	1		1					
74	275	201	J Oral Rehab	201	37(7)	Kimoto S	4	76	84.4
75	9	0		0					
76	285	201	Int J Prosth	201	25(4)	Gjengedal H	2	53	58.9
77	2	2		2					

1	286	201	Int J Prosth	201	25(3)	Stober T	2	53	58.9
2	5	2		2					
3	286	201	Int J Prosth	201	25(3)	Sagirkaya E	2	63	70.0
4	7	2		2					
5	286	201	Int J Prosth	201	25(3)	Volpato Sanita P	3	70	77.8
6	8	2		2					
7	288	201	Int J Prosth	201	25(2)	Elsyad M	2	54	60.0
8	6	2		2					
9	288	201	Int J Prosth	201	25(2)	Machado de Andrade I	1	49	54.4
10	7	2		2					
11	294	201	Int J Prosth	201	24(4)	Zicari F	3	72	80.0
12	7	1		1					
13	299	201	Int J Prosth	201	24(1)	Cehreli M	2	62	68.9
14	3	1		1					
15	300	201	Int J Prosth	201	23(6)	Larsson C	0	49	54.4
16	7	0		0					
17	303	201	Int J Prosth	201	23(4)	Cune M	0	52	57.8
18	0	0		0					
19	305	201	Int J Prosth	201	23(3)	Klat-amnuay S	3	79	87.8
20	5	0		0					
21	306	201	Int J Prosth	201	23(2)	Kimoto S	4	76	84.4
22	0	0		0					
23	308	200	Int J Prosth	200	22(6)	Sailer I	2	57	63.3
24	6	9		9					
25	312	200	Int J Prosth	200	22(4)	Walton J	4	78	86.7
26	0	9		9					
27	312	200	Int J Prosth	200	22(4)	Pradies G	2	62	68.9
28	6	9		9					
29	314	200	Int J Prosth	200	22(3)	Cannulo L	3	69	76.7
30	3	9		9					
31	314	200	Int J Prosth	200	22(3)	Haim M	2	57	63.3
32	8	9		9					
33	321	200	Int J Prosth	200	21(4)	Berg E	2	58	64.4
34	9	8		8					
35	322	200	Int J Prosth	200	21(4)	Luthardt R	2	50	55.6
36	1	8		8					
37	329	200	Int J Prosth	200	20(5)	Naumann M	2	61	67.8
38	8	7		7					
39	333	201	Int J Periodontics Restorative Dent	201	32(4)	Cardaropoli D	4	67	74.4
40	0	2		2					
41	334	201	Int J Periodontics Restorative Dent	201	32(3)	Riza Certin A	0	51	56.7
42	7	2		2					
43	335	201	Int J Periodontics Restorative Dent	201	32(3)	Griffiths G	1	56	62.2
44	1	2		2					
45	335	201	Int J Periodontics Restorative Dent	201	32(2)	Jankovic K	2	60	66.7
46	8	2		2					
47	336	201	Int J Periodontics Restorative Dent	201	32(2)	Margossian P	3	57	63.3
48	1	2		2					
49	337	201	Int J Periodontics Restorative Dent	201	32(1)	Cordaro L	2	73	81.1
50	7	2		2					
51	338	201	Int J Periodontics Restorative Dent	201	31(6)	Froum S	2	59	65.6
52	8	1		1					
53	344	201	Int J Periodontics Restorative Dent	201	31(2)	Rasperini G	1	50	55.6
54	8	1		1					
55	350	201	Int J Periodontics Restorative Dent	201	30(3)	Rasperini G	1	57	63.3
56	4	0		0					
57	351	201	Int J Periodontics Restorative Dent	201	30(2)	Wu S-Y	0	51	56.7
58	5	0		0					
59	353	200	Int J Periodontics Restorative Dent	200	29(6)	Trammel K	3	49	54.4
60	5	9		9					
	357	200	Int J Periodontics Restorative Dent	200	29(2)	Haghighati F	0	44	48.9
	9	9		9					
	358	200	Int J Periodontics Restorative Dent	200	29(1)	Cardaropoli D	2	47	52.2
	9	9		9					
	360	200	Int J Periodontics Restorative Dent	200	28(5)	Merli M	2	59	65.6
	7	8		8					
	361	200	Int J Periodontics Restorative Dent	200	28(4)	Jung R	1	42	46.7
	9	8		8					

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