



# Fate of abstracts presented at a National Turkish Orthopedics and Traumatology Congress: publication rates and consistency of abstracts compared with their subsequent full-text publications

Merter YALÇINKAYA<sup>1</sup>, A. Erdem BAGATUR<sup>2</sup>

<sup>1</sup>Department of Orthopedics and Traumatology, Metin Sabancı Baltalimanı Bone Diseases Training and Research Hospital, İstanbul, Turkey;

<sup>2</sup>Department of Orthopedics and Traumatology, Medicana International İstanbul Hospital, İstanbul, Turkey

**Objective:** The aim of this study was to evaluate the publication rates of full-text articles after presentation of abstracts at a Turkish National Orthopedics and Traumatology Congress, determine the time lag from the congress date to publication of full-text articles and assess the consistency between abstracts and the subsequent publications.

**Methods:** All abstracts from the scientific program of the 20th Turkish National Orthopedics and Traumatology Congress (2007) were identified and computerized PubMed searches were conducted to determine whether an abstract had been followed by publication of a full-text article and key features were compared to evaluate their consistency. The time lag to publication and the impact factors of the journals where the articles were published were noted.

**Results:** Of the 770 abstracts (264 oral, 506 poster presentations), 227 (29.5%) were followed by a full-text and 116 (44%) of the 264 oral and 111 (22%) of the 506 poster presentations were published. The mean time to publication was 14.9±16.075 (range: -33 to 55) months. Thirty-three (14.5%) were published prior to the presentation at the congress. The likelihood of publication decreased after the third year (26 of 227, 11.5%). A total of 182 (80.2%) articles showed inconsistencies with the abstract; 74 (32.6%) minor, 14 (6.2%) major, and 94 (41.4%) minor and major inconsistencies. The mean impact factor of the journals was 1.152±0.858.

**Conclusion:** The vast majority of abstracts presented at this congress were not followed by publication of a full-text article. Additionally, frequent inconsistencies between the final published article and the original abstract indicated the inadequacy of quality of reporting in abstracts.

**Key words:** Abstract; congress; indexed journal; orthopedics; peer-reviewed journal; presentation; publication; scientific meeting.

Many abstracts presented at scientific meetings are never published as full-text articles in peer-reviewed, indexed journals.<sup>[1]</sup> The quality of an abstract is associated with the likelihood of subsequent publication.<sup>[1-3]</sup> Consequently, the publication rate of the presented

abstracts in a meeting is one of the factors determining the scientific quality of the meeting.

The number of meetings and abstracts presented is continuously increasing. The likelihood of subsequent publication has increased in importance as the new

**Correspondence:** Merter Yalçinkaya, MD. Metin Sabancı Baltalimanı Kemik Hastalıkları Eğitim ve Araştırma Hastanesi, Ortopedi ve Travmatoloji Kliniği, Rumeli Hisarı Cad., No: 62, 34470 Baltalimanı, İstanbul, Turkey.

Tel: +90 212 - 323 70 75 e-mail: merter\_99@hotmail.com

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information disseminated can guide physicians in their clinical practice. Therefore, it is important to question the scientific validity of these presentations through the assessment of their subsequent publication rates in the peer-reviewed literature and to evaluate the consistency between the abstracts and their subsequent full-text articles.

The objectives of this study were to evaluate the publication rates of full-text articles after presentation of abstracts at a Turkish National Orthopedics and Traumatology Congress, determine the time lag from the congress date to publication of full-text articles, and assess the consistency between abstracts and the subsequent publications.

## Materials and methods

The 20th Turkish National Orthopedics and Traumatology Congress (October 23rd through 28th 2007, Ankara, Turkey) was chosen as the reference meeting. Seven hundred and ninety-one abstracts were submitted and 773 (97.7%) (264 oral and 509 poster presentations) were selected for presentation by the *Congress Presentation Evaluation Committee* using previously determined criteria (Serdar Özbarlas, personal communication, October 16, 2012).

All abstracts from the scientific program published in the congress booklet of *Acta Orthopaedica et Traumatologica Turcica*<sup>[4]</sup> were identified and subdivided into oral and poster presentations. To determine whether a presentation abstract had been followed by publication of a full-text article, computerized PubMed (<http://www.ncbi.nlm.nih.gov/pubmed>) searches were conducted separately by each author of this study, which included all publications by all authors, starting with the first author. Searches were first performed using author names. If no results were found the search was repeated using key words from the abstract title combined with author names, using the Boolean operator *AND*. If differences in the title or authors of a published article were recognized, the contents of the presentation abstract and the published article were compared and the full-text article was either accepted or excluded as a subsequent publication.

The following parameters from each presentation abstract that had been followed by publication of a full-text article were identified:<sup>[1]</sup> (1) abstract title, (2) number of authors, (3) first author's name, (4) names of other authors, (5) study objective/hypothesis, (6) sample size, (7) statistical analysis (methods and significance), (8) primary outcome measure (main outcome of interest; mortality, infection, nonunion, etc.), (9)

study result for a specific outcome (numerical value; a percentage or a mean), and (10) measure of precision around the study result (standard deviation and confidence interval).

In addition to the abovementioned parameters, (1) publication date and (2) time lag to publication from each final full-text article were identified. Presentations published before the congress were included in the study and their publication period was accepted as minus (-) months.

The impact factors of the journals where the articles were published, as of September 2012, were noted. Impact factors were determined using the Journal Citation Report<sup>[5]</sup> and Scientific Journal Rankings.<sup>[6]</sup>

The consistency of reporting between the abstract and the final publication was evaluated using a similar methodology as previously described.<sup>[1]</sup> Inconsistencies were categorized as minor or major.

Minor inconsistencies included differences in (1) the full-text article title, (2) number of authors, (3) first author's name, and (4) names of other authors.

Major inconsistencies included discrepancies in (1) the study objective/hypothesis, (2) sample size, (3) statistical analysis, (4) primary outcome measure, (5) study results, and (6) measures of precision.

Data were analyzed using the PASW Statistics 18 statistical software package (2009; SPSS Inc., Chicago, IL, USA). Intra-class correlation coefficient with 95% confidence interval and kappa coefficient provided estimates of interobserver agreement in the data abstraction. The McNemar test was used to assess the concordance of interobserver data abstraction. The t-test was used to assess the association between the time lag to publication and consistency. Significance level was set at  $p < 0.05$ .

## Results

Of the 770 scientific abstracts (264 oral, 506 poster presentations) published in congress booklet of *Acta Orthopaedica et Traumatologica Turcica*,<sup>[4]</sup> 227 (29.5%) were followed by a full-text publication in peer-reviewed journals indexed by PubMed. Although the number of poster presentations was given as 509, 3 poster abstracts were absent, making the number 506. While 116 (44%) of the 264 oral presentations were published, only 111 (22%) of the 506 poster presentations were published. Reviewers achieved adequate agreement in the data abstraction (intra-class correlation coefficient = 0.958, 95% confidence interval = 0.942 to 0.971; kappa coefficient=0.896;  $p < 0.001$ ). Distribution of the numbers of

full-text publications missed during computerized searches by the two reviewers were concordant (McNemar’s test,  $p=0.597$ ).

The mean time to publication for all abstracts was  $14.9 \pm 16.075$  (median: 13, range: -33 to 55) months. Thirty-three (14.5%) abstracts were published as full-text articles prior to the presentation at the congress (mean: -7.5 months; range: -33 to -1 months). The majority of the presentation abstracts (168, 74%) were published as full-text articles during the first three years after the congress; 79 (34.8%) in the first year, 55 (24.2%) in the second year, and 34 (15%) in the third year. The likelihood of publication decreased after the third year (26 of 227, 11.5%) (Table 1).

Full-text articles were published in 56 different journals, with 106 (46.7%) in the following five journals topping the list: 52 (22.9%) *Acta Orthopaedica et Traumatologica Turcica*, 15 (6.6%) *Joint Diseases and Related Surgery*, 14 (6.2%) *Knee Surgery, Sports Traumatology, Arthroscopy*, 14 (6.2%) *Archives of Orthopaedic and Trauma Surgery*, and 11 (4.8%) *International Orthopaedics* (Table 2). Full texts of 102 articles could be reached through the internet by free access.

The mean impact factor of the journals where the articles were published, as of September 2012, was  $1.152 \pm 0.858$  (median: 0.763; range: 0.169 to 3.272) (Table 2).

A total of 182 (80.2%) articles showed changes from their presentation abstracts (Table 3). There was no inconsistency in 45 articles (19.8%). Seventy-four (32.6%) articles had minor inconsistencies, 14 (6.2%) had major inconsistencies, and 94 (41.4%) had both minor and major inconsistencies.

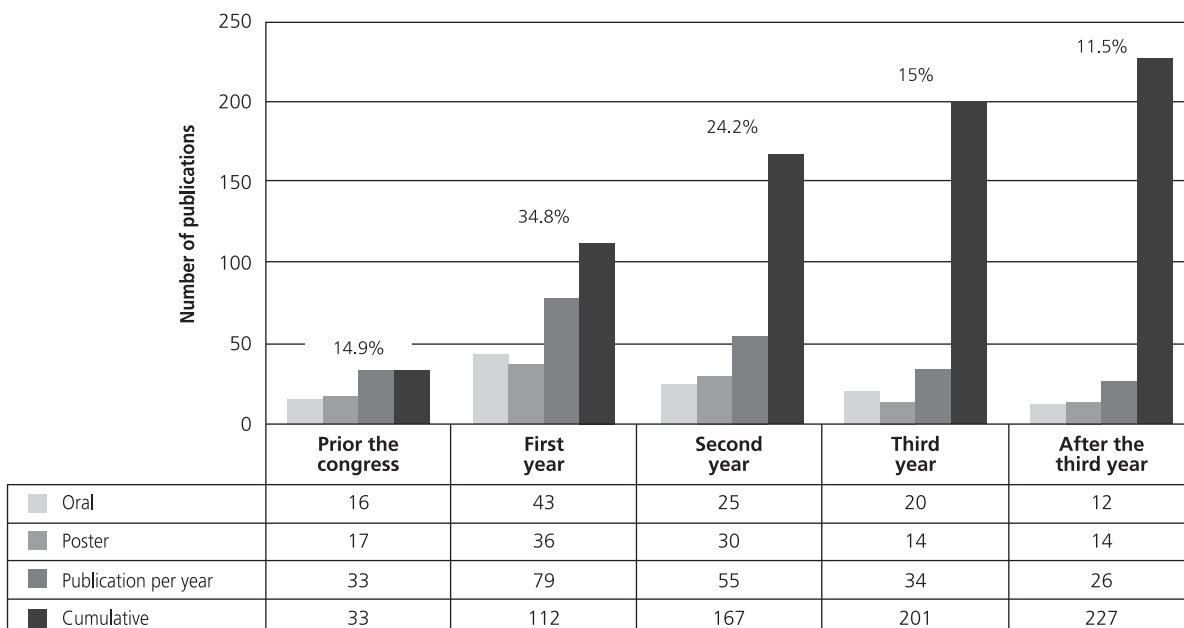
Minor inconsistencies included changes in the study title in 77 (33.9%), number of authors in 101 (44.5%), first author’s name in 47 (20.7%) and names of other authors in 139 (61.2%).

Major inconsistencies included discrepancies in the study objective/hypothesis in 26 (11.5%), sample size in 62 (27.3%), primary outcome measure in 33 (14.5%) and study results in 78 (34.4%).

The time lag to publication was  $7.8 \pm 12.95$  months in the group with no inconsistencies and  $16.7 \pm 16.31$  months in the group with inconsistencies (t-test,  $p=0.0001$ ).

Although discrepancies in statistical analysis and measures of precision were included in the major inconsistencies list in the beginning of the study, sound data could not be collected in these two subjects. In 91 (40.1%) instances, statistical analyses (methods and significance) were consistent between the abstract and the full-text article, and inconsistent in 10 (4.4%). In 126 (55.5%) of the presentation abstracts, comparison with the full-text article could not be performed because statistical analyses were not mentioned. Likewise, data reporting measures of precision were

**Table 1.** Time to publication.



**Table 2.** Publication rate per journal.

Ranking	Journal	Impact factor 2011	Source of impact factor	Overall (N,%)	Index
1	Acta Orthopaedica et Traumatologica Turcica	0.337	TR-JCR 2011	52 (22.9%)	SCI-E
2	Joint Diseases and Related Surgery	0.708	TR-JCR 2011	15 (6.6%)	SCI-E
3	Knee Surgery, Sports Traumatology, Arthroscopy	2.209	TR-JCR 2011	14 (6.2%)	SCI
4	Archives of Orthopaedic and Trauma Surgery	1.369	TR-JCR 2011	14 (6.2%)	SCI-E
5	International Orthopaedics	2.025	TR-JCR 2011	11 (4.8%)	SCI-E
6	Journal of Pediatric Orthopaedics B	0.467	TR-JCR 2011	8 (3.5%)	SCI-E
7	Foot & Ankle International	1.218	TR-JCR 2011	7 (3.1%)	SCI-E
8	Turkish Journal of Trauma & Emergency Surgery	0.333	TR-JCR 2011	7 (3.1%)	SCI-E
9	Clinical Orthopaedics and Related Research	2.533	TR-JCR 2011	5 (2.2%)	SCI
10	Journal of the American Podiatric Medical Association	0.567	TR-JCR 2011	5 (2.2%)	SCI-E
11	Acta Orthopaedica Belgica	0.401	TR-JCR 2011	5 (2.2%)	SCI-E
12	Journal of Bone & Joint Surgery Am	3.272	TR-JCR 2011	4 (1.8%)	SCI
13	Journal of Orthopaedic Trauma	2.135	TR-JCR 2011	4 (1.8%)	SCI
14	Spine	2.078	TR-JCR 2011	4 (1.8%)	SCI
15	Injury	1.975	TR-JCR 2011	4 (1.8%)	SCI-E
16	Journal of Spinal Disorders & Techniques	1.503	TR-JCR 2011	4 (1.8%)	SCI-E
17	Journal of Foot and Ankle Surgery	0.516	TR-JCR 2011	4 (1.8%)	SCI-E
18	Arthroscopy: The Journal of Arthroscopic and Related Surgery	3.024	TR-JCR 2011	3 (1.3%)	SCI
19	The Journal of Trauma and Acute Care Surgery	2.478	TR-JCR 2011	3 (1.3%)	SCI
20	Journal of Hand Surgery Eur Vol	1.171	TR-JCR 2011	3 (1.3%)	SCI
21	Journal of Pediatric Orthopaedics	1.156	TR-JCR 2011	3 (1.3%)	SCI-E
22	Hip International	0.763	TR-JCR 2011	3 (1.3%)	SCI-E
23	Journal of Bone & Joint Surgery Br	2.832	TR-JCR 2011	2 (0.9%)	SCI
24	Journal of Shoulder and Elbow Surgery	2.747	TR-JCR 2011	2 (0.9%)	SCI
25	Orthopedics	2.664	TR-JCR 2011	2 (0.9%)	SCI-E
26	Joint Bone Spine	2.274	TR-JCR 2011	2 (0.9%)	SCI
27	European Spine Journal	1.965	TR-JCR 2011	2 (0.9%)	SCI-E
28	Knee	1.736	TR-JCR 2011	2 (0.9%)	SCI-E
29	Journal of Hand Surgery Am	1.354	TR-JCR 2011	2 (0.9%)	SCI-E
30	Journal of Orthopaedic Science	0.843	TR-JCR 2011	2 (0.9%)	SCI-E
31	Indian Journal of Orthopaedics	0.503	TR-JCR 2011	2 (0.9%)	SCI-E
32	Journal of Orthopaedics and Traumatology	0.5	SJR	2 (0.9%)	-
33	Cases Journal	0.209	SJR	2 (0.9%)	-
34	Journal of Orthopaedic Research	2.811	TR-JCR 2011	1 (0.4%)	SCI
35	Journal of Biomedical Materials Research Part A	2.625	TR-JCR 2011	1 (0.4%)	SCI
36	Skeletal Radiology	1.541	TR-JCR 2011	1 (0.4%)	SCI
37	Hematology	1.487	TR-JCR 2011	1 (0.4%)	SCI-E
38	Journal of Clinical Rheumatology	1.364	TR-JCR 2011	1 (0.4%)	SCI-E
39	Annals of Plastic Surgery	1.318	TR-JCR 2011	1 (0.4%)	SCI
40	The Journal of Emergency Medicine	1.306	TR-JCR 2011	1 (0.4%)	SCI-E
41	Clinical Anatomy	1.289	TR-JCR 2011	1 (0.4%)	SCI
42	Prosthetics and Orthotics International	0.95	TR-JCR 2011	1 (0.4%)	SCI-E
43	The Journal of International Medical Research	0.896	TR-JCR 2011	1 (0.4%)	SCI
44	Medical Science Monitor	0.893	SJR	1 (0.4%)	-
45	Biochemical Genetics	0.862	TR-JCR 2011	1 (0.4%)	SCI
46	Journal of Craniofacial Surgery	0.822	TR-JCR 2011	1 (0.4%)	SCI
47	Pediatrics International	0.626	TR-JCR 2011	1 (0.4%)	SCI-E
48	Acta Cirurgica Brasileira	0.584	TR-JCR 2011	1 (0.4%)	SCI-E
49	Saudi Medical Journal	0.52	TR-JCR 2011	1 (0.4%)	SCI-E
50	The Turkish Journal of Pediatrics	0.441	TR-JCR 2011	1 (0.4%)	SCI-E
51	Strategies in Trauma and Limb Reconstruction	0.349	SJR	1 (0.4%)	-
52	Journal of Orthopaedic Surgery	0.312	SJR	1 (0.4%)	-
53	Iowa Orthopaedic Journal	0.294	SJR	1 (0.4%)	-
54	The American Journal of Orthopedics	0.249	SJR	1 (0.4%)	-
55	La Chirurgia degli Organi di Movimento (Musculoskeletal Surgery)	0.211	SJR	1 (0.4%)	-
56	Hand surgery: An international journal devoted to hand and upper limb surgery and related research; Journal of the Asia-Pacific Federation of Societies for Surgery of the Hand	0.169	SJR	1 (0.4%)	-

consistent in 36 (15.9%) instances between the presentation abstract and the full-text article and in 191 (84.1%) of the presentation abstracts measures of precision were not mentioned at all.

Two poster abstracts were the same word by word with the exception of the study title and this study was published as a single full-text article with two minor inconsistencies.

## Discussion

Presentations at meetings provide an important forum at which to convey current research findings in all areas of medicine. Eventual publication of these presentations in peer-reviewed journals is the ultimate goal of scientific research. Since these meetings serve as a considerable part of the on-going medical education, it is important to evaluate the scientific validity of these presentations by assessing their subsequent publication rates in peer-reviewed, indexed journals, compare them with previously reported similar data and analyze developing trends.<sup>[7]</sup>

The peer-reviewed literature is full of numerous reports documenting the publication rates, predictors of publication, and consistency of abstracts compared with subsequent full-text articles of oral and poster abstracts presented at national and international specialty and subspecialty meetings.<sup>[3,8-12]</sup> This is the first study reporting the publication rates of presentations of a Turkish National Orthopedics and Traumatology Congress. Moreover, to the best of our knowledge, there is only one previous report from Turkey analyzing the publication rates of a national Turkish meeting, and it is in the field of radiology.<sup>[13]</sup>

Reports across medical specialties have documented that a considerable number of presentations never reach the ultimate goal of publication, with rates ranging from 22 to 89%.<sup>[1]</sup> The 5-year publication rates for widely-recognized orthopedic meetings have been reported as: Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS) (1996) 34%,<sup>[1]</sup> (1990-1992) 46%,<sup>[14]</sup> (2001) 49%;<sup>[7]</sup> Annual Meeting of the British Orthopaedic Association, (1997 and 1998) 35.3%,<sup>[15]</sup> (2001) 36.3%<sup>[16]</sup> and Congress of the German Society of Orthopaedics and Trauma Surgery (2012) 36%.<sup>[17]</sup>

When subspecialty meetings are analyzed, the publication rates were usually higher: Annual Congress of the Spine Society of Europe (2000-2003) 37.8%;<sup>[18]</sup> The American Association of Hip and Knee Surgeons annual meeting (1996-2001) 58%;<sup>[3]</sup> The Annual meeting of Pediatric Orthopaedic Society of North America (2002

**Table 3.** Consistency between the presentation abstracts and full-text articles.

	Number of inconsistencies	%
<b>Minor inconsistency</b>		
Study title	77	33.9
Number of authors	101	44.5
First author's name	47	20.7
Names of other authors	139	61.2
<b>Major inconsistency</b>		
Study objective/hypothesis	26	11.5
Sample size	62	27.3
Primary outcome measure	33	14.5
Study results	78	34.4
Statistical analyses	10	4.4
Measures of precision	-	-

through 2006) 50.7%,<sup>[19]</sup> (2003 through 2005) 58.9%;<sup>[20]</sup> The Biennial Meeting of the International Society of Arthroscopy, Knee Surgery and Sports Medicine (1997) 34.6%,<sup>[21]</sup> (1999) 39.3%;<sup>[21]</sup> The Annual Meeting of American Orthopaedic Society for Sports Medicine (1999 through 2001) 59.4%;<sup>[22]</sup> The Annual meeting of the Orthopaedic Trauma Association (1990 through 1995) 64%;<sup>[23]</sup> The Annual meeting of the North American Spine Society (1990 through 1992) 40%;<sup>[24]</sup> The Annual meeting of the Scoliosis Research Society (1991 through 1993) 47%;<sup>[24]</sup> and The Annual meeting of the International Society for the Study of the Lumbar Spine (1991 through 1993) 45%.<sup>[24]</sup>

The low overall rate (29.5%) of full-text publication (44% of oral presentations vs 22% of poster presentations) after the 20th Turkish National Orthopedics and Traumatology Congress is apparent. The 44% rate of publication of oral presentations is comparable with similar meetings. However, the even lower publication rate of the poster presentations is striking. This data suggests that the scientific quality of the oral and the poster presentations at the 20th Turkish National Orthopedics and Traumatology Congress were not equivalent. Common belief expects poster presentations to publish at a lower rate than oral presentations, the latter being typically believed to

**Table 4.** Consistency vs. publications.

	Number of publications and percentage
Minor and major inconsistencies	94 (41.4%)
Minor inconsistency only	74 (32.6%)
Major inconsistency only	14 (6.2%)
No inconsistencies	45 (19.8%)



consist of studies of higher scientific value.<sup>[25]</sup> However, the 22% rate is not acceptable.

This may be partly due to the high number of abstracts accepted for presentations. The Congress Presentation Evaluation Committee is responsible for selection of the studies to be presented at each biennial meeting and uses previously determined criteria for this selection. In 2007, out of the 791 abstracts submitted 773 (97.7%) (264 oral, 509 posters) were selected for presentation while only 18 (2.3%) were rejected (Serdar Özbarlas, personal communication, October 16, 2012). In 2009, out of the 864 abstracts submitted 793 (91.8%) (273 oral, 520 posters) were selected for presentation, and only 71 (8.2%) rejected.<sup>[26]</sup> In 2011, out of the 968 abstracts submitted 866 (89.5%) (390 oral, 476 posters) were selected and only 102 (10.5%) were rejected.<sup>[27]</sup> A tendency towards increasing rejection rates is observed. On the other hand, although the number of abstracts submitted for the annual meeting has grown continuously, AAOS keeps overall acceptance around 25% each year, equally split between oral and poster presentations.<sup>[7]</sup>

The 2007 meeting was chosen for this study to allow for sufficient publication time. In similar studies in the field of orthopedics, the mean time to publication were 17.6±12 (range: 1 to 56) months<sup>[1]</sup> and 15.6±11.14 (range: -7 to 56) months.<sup>[16]</sup> One study found that 63% of presentations were published within the first 2 years after presentation and the total number of published presentations increased each year; however, the likelihood of publication decreased after the third year.<sup>[7]</sup> These figures imply that five years is sufficient to draw a conclusion about publication rates.

In our study, mean time to publication was 14.9±16.075 (range: -33 to 55) months. One hundred and sixty-eight (74%) of the presentations were published within the first 3 years, and 26 (11.5%) in the 4th and 5th years. When including the 33 (14.5%) presentation abstracts published as full-text articles prior to the congress, the number becomes 201 (88.5%). Therefore, we can assume that a long wait does not significantly change the publication rate. This rate is comparable with that of other medical societies with published data.<sup>[1,7,16]</sup>

Frequent changes were made in the number of authors (101, 44.5%), first author's name (47, 20.7%) and names of other authors (139, 61.2%). More interesting was that these changes were usually made without changing the study itself, implying that the newly added authors might not have made any contribution to the research. This, of course, is contradictory to the widely recognized manuscript preparation and author-

ship guidelines, in which the authors must declare that they were involved in at least three of the five stages of the study (designing the study, collecting data, analyzing data, writing the manuscript, and confirming the accuracy of the data and the analyses) and should take public responsibility for one or more aspects of the study.<sup>[28,29]</sup>

The common major inconsistencies were changes in study results (78, 34.4%) and sample sizes (62, 27.3%). These findings lead to the questioning of the validity of the studies. However, the presence of inconsistencies did not affect publication rates (Table 4).

The discrepancies in these studies may be due to many factors. Some changes were probably made to increase the publication chances.<sup>[22,30]</sup> The process of peer review often leads to changes, usually due to reviewer suggestions, and the academic careers of physicians are evaluated by examining the number and quality of their publications; which keeps especially young researchers under pressure.<sup>[31]</sup> Although minor inconsistencies may not be critical for study quality or validity, such discrepancies should be kept to a minimum. On the other hand, major inconsistencies may change the interpretation and conclusion of articles and must be avoided.

Evaluating a national congress by using an international database appears to be a limitation of the study. However, final publications indexed in PubMed are acknowledged internationally and therefore we did not use the domestic indices. Additionally, the three Turkish orthopedics journals, *Acta Orthopaedica et Traumatologica Turcica*, *Joint Diseases and Related Surgery*, and *Turkish Journal of Trauma & Emergency Surgery* are indexed in PubMed. Consequently, journals not indexed in PubMed were not considered.

The international publication ratio of scientific presentations of the Turkish National Orthopedics and Traumatology Congress was demonstrably lower than that of other national/international meetings outside of Turkey. Furthermore, most presentation abstracts failed to provide the necessary information to assess methodological quality. Knowing the fate of abstracts should be of interest to meeting organizers, as it would serve as a quality measure for their abstract selection process. The reason for the rise in the rates of publication for the annual meetings of the AAOS from 34% (1996)<sup>[1]</sup> to 49% (2001)<sup>[7]</sup> was reported to be the result of the AAOS program committee's continual efforts to increase the scientific quality of the presented studies.<sup>[7]</sup>

There is an increased interest in publication in the orthopedics field and country rankings of orthopedics publications in major orthopedics journals are avail-

able.<sup>[22,32]</sup> In the year 2000, 2,889 articles were published in the orthopedics field and in 2009 the number rose to 6,909, with a worldwide annual increase of 10.2%.<sup>[32]</sup> The quantity and quality of published articles define the academic level of a society as well as the country. For this reason, it would be recommended that the Turkish Society of Orthopedics and Traumatology and the Congress Presentation Evaluation Committee take the required measures to adopt an effective selective procedure for the acceptance of presentation abstracts, which may lead to an increased publication ratio. Implementing a more standard and structured abstract format that requires authors to provide the necessary study details, designating the level of evidence of the research and indicating the type of research (randomized trial, observational study, review, case report, survey, or basic science) described by the presentation abstract may improve overall quality. Future studies of publication rates at more recent congresses are needed to evaluate the results of these efforts and the developing trends.

**Conflicts of Interest:** No conflicts declared.

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