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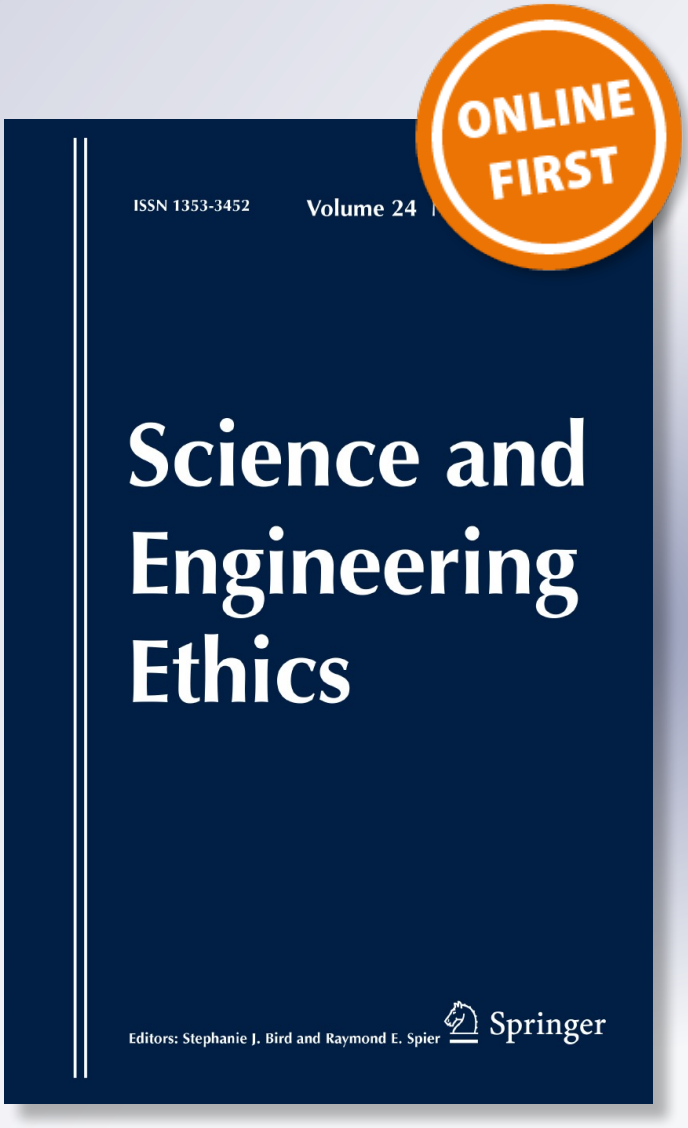

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ORIGINAL PAPER

Relationship Between Declarations of Conflict of Interests and Reporting Positive Outcomes in Iranian Dental Journals

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Abstract Conflict of interests is a situation when someone is in need of other people's trust on one the hand and has personal or general interests on the other hand, resulting in conflict with the given responsibility. In this research work, an attempt was made to find the relation between declarations of conflict of interests and reporting positive outcomes in the dental journals in Iran (2000–2016). In this analytical/cross-sectional study, first Health and Biomedical Information was searched and all the Persian and English dental journals published in Iran were collected. Then, all the papers published in the journals from December 2000 to December 2016 were collected and categorized in terms of the year of publication, author or authors' affiliations, Persian and English journal, type of the substance or the drug used (including the manufacturing company), declarations of conflict of interests and the positive or negative conclusion of the report. Data were analyzed with the Fisher's exact test and Chi squared test, using the program SPSS 18. In numerical analysis, the significance was set at $P < 0.05$. Seventeen dental journals in Persian and English were analyzed: 10 in English and 7 in Persian. Reviewing these studies showed that of 1021 articles in Persian, in 128 cases there was no mention of a declaration of conflict of interests and in 11 cases, the COI had been stated. In addition, from 1220 articles in English, in 825 cases there was no mention of declarations of conflict of interests and in 45 cases, the declarations of COI had been mentioned. There was no significant relation between the COI and 'no' COI and the reporting of positive outcomes in papers in Iranian dental journals in terms of the journal type, year of

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publication and the journals' guarantee form ($P = 0.25$, $P = 0.41$ and $P = 0.09$). A total of 83% of studies with declarations of COI had one positive outcome, with a significant relationship in this field; however, in 73% of studies with no COI, there was one positive outcome, too. In general, the society expects that doctors would not consider any incentives except the health of the patients in the efforts made by them. The severity of the consequences of COI is of higher value when the patients' health is endangered due to it. In addition, COI might change the attitude and approach of other doctors and peers.

Keywords Declarations of conflict of interests · COI · Positive effect · Dentistry

Introduction

One of the most important assets of any scientific community is the prestige and the credit attained over time based on the accuracy and usefulness of the produces information. Normally, people respect scientists and scholars, and most of them believe in the veracity and legitimacy of their words and actions, and in many cases, their speech and behavior are exemplary for different levels of the society. Thus, each of them must adhere to ethical principles, maintain morality and be the guardian of the trust and support which they have achieved over the centuries. This is pragmatic only when all those who have a role in the production, dissemination and sharing of knowledge are honest and sincere. This commitment to ethical principles in the process of production of scientific works is the very important because any scientific work published would be recognized as a credible document. Therefore, the validity of these documents is of great significance and importance (Mansorian 2012).

In the Persian dictionary, the word 'conflict' means the 'opposite', 'being protested', 'disturb each other', 'act of opposing' or 'state of being opposed' (Shaebani 2007).

When a party or a group tries to prevent another group from achieving its ambition, by the application of different influences, such as money, career, prestige, power or anything else, contradictions will become manifested (conflict of interests) (Rezaeian 2011).

In 1998, the Ontario Court of Canada defined a person's relationship with their professional duty that entailed a reasonable fear of affecting their professional actions. There is no need to prove the actual effect of the conflict of interests, but the possibility of a secondary benefit suffices (Thompson 1993).

Conflict of interests has another exegesis in ethics, it is manifested in situations in which personal and economic interests are of a higher value compared to systematic, principled, transparent and precise findings. For instance, where the negative impact of promotional activities in a region or harmful environmental effects of new species of crops was not mentioned (Drazen et al. 2007).

A search in the Persian sources brought up no research reporting declarations of COI in the Iranian dental journals. Therefore, the aim of this study was to investigate the relationship between declarations of conflict of interests between dental

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researchers and companies and the effects of these conflicts in papers in Iranian dental journals.

Materials and Methods

In this cross-sectional study, the Health and Biomedical Information (HBI) website was used. The list of dental journals in Persian and English (17 journals) was collected. Then the website of each journal was the visited, and all the papers from December 2000 to December 2016, were collected. After reviewing the titles and abstracts by two of the present authors who were calibrated relative to one another. In this case the relevant literature was collected, and the full text was extracted either from the website or print-out of the journal. In the cases in which the full text was not accessible through the website, the manuscript was requested first from the journal, and if that wasn't possible, it was requested from the author. The articles were then categorized and sorted in terms of the year of publication, affiliation, author(s), Persian or English journal, type of material or medications used (including the manufacturing company), report of declaration of conflict of interests and positive or negative outcomes of the tests under consideration. Also, the website of the journal was visited and the form of the conflict of interests was extracted. In the next stage, data were classified in terms of journal title, year of publication, the presence or absence of a COI form, whether or not the COI form conformed to the standards or not, title, type of magazine (Persian or English), year of publication, number of the authors, affiliation, drugs or substances used, manufacturing or distributing company, affiliation of authors and manufacturing or distributing company, the positive or negative effect of the substance or drug used, the acknowledgement for sponsors and the presence or absence of a COI document. Then a contact was made with the director of the magazine, and information about the obligation of authors to mention and for filling up a COI form was obtained.

Data were analyzed with the Fisher's exact and Chi squared tests, using the program SPSS 18. In numerical analysis, the significance was set at $P < 0.05$.

Results

In this study, 17 dental journals in English and in Persian were evaluated (10 English journals and 7 Persian journals). By examining the published articles, 2241 articles were eligible to be included in our research. A total of 1220 (54.4%) articles had been published in English journals and 1021 (45.6%) articles in Persian ones.

This study showed that only 6 journals used the COI form in their appendix, and 6 journals asked the authors to submit the COI form if they had one.

Evaluation of articles showed that 128 articles of 1021 articles in Persian had no declaration of conflict of interests, and 11 articles had COI. The COI included receiving treatment from the manufacturer (5 cases), institutional affiliation of the author (3 cases) and funding of the research by pharmaceutical companies (3 cases). In addition, 825 articles of 1220 English articles had no declarations of

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Table 1 Absolute and relative frequencies of mentioning or not mentioning the declarations of COI in articles in Persian and English

Type of paper	No mention of the declarations COI		No COI		COI	
	No.	%	No.	%	No.	%
Persian	882	71.6	128	13.4	11	19.6
English	350	28.4	825	86.6	45	80.4
Total	1232	100	953	100	56	100

Table 2 Absolute and relative frequency mention or not mention the declarations of COI (2010–2016) and comparison with the time period before 2010 in Persian and English journals

Year of publication	English journal						Persian journals					
	Mention of the declarations COI			No mention of the declarations COI			Mention of the declarations COI			No mention of the declarations COI		
	No.	%	*P* value	No.	%	*P* value	No.	%	*P* value	No.	%	*P* value
Before 2010	41	29.5	0.001	767	87		51	5.9		245	70	*0.001
2010–2016	98	70.5		115	13	0.001	819	94.1	0.001	95	30	
Total	139	100		882	100		870	100		350	100	

*Fisher's exact test

conflict of interests, and declarations of COI were included in 45 cases. The COI included receiving treatment from the company (25 cases), institutional affiliation of the author (7 cases), and funding of the research by the drug company (13 cases) (Table 1).

The results showed that between 2010–2016, the number of articles with no declarations of COI was three times more than the articles published before 2010. This was seen in particular in English publications more clearly and there was a significant correlation ($P = 0.01$). COI in English and Persian journals exhibited more consistency between 2010 and 2016 (Table 2).

From 1021 articles in Persian, 888 articles (87%) were conducted using sponsorship of public sector, and 112 articles (11%) were conducted using private sector's funding. In addition, 2% of articles (MacKenzie and Rogers 2015) had not reported any financial support.

A total of 75% of articles in English (915 articles) were conducted using public sector's sponsorship, and 20% of cases (244 articles) were conducted using private sector's sponsorship. In addition, 5% (61) of articles did not report any financial support.

This study showed that English and Persian articles with or without COI, are almost the same in using random assignment, double-blindness and placebo. However, the foregoing differences between English and Persian journals were sited here.

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Table 3 Absolute and relative frequencies of outcome in Persian and English papers in terms of COI

Papers	Persian papers				English papers			
	Positive COI		No COI or no mention of the declarations COI		Positive COI		No COI or no mention of the declarations COI	
	No	%	No	%	No	%	No	%
Total papers	8	100	100	100	43	100	809	100
Drug > placebo	6	75	64	64	36	77	602	74.4
Drug ≤ placebo	2	25	36	36	7	23	207	25.6

A total of 83% of studies with COI had one positive outcome, and a significant association was found ($P = 0.001$). However, 73% of studies with no COI or no mention of declarations of COI had one positive outcome (Table 3).

There was no correlation between the presence or absence of COI and reported positive effects in clinical trials in Persian dental journals in terms of journal type, year of publication and form of commitment of journal ($P = 0.41$, $P = 0.09$ and $P = 0.25$, respectively).

Discussion

Based on the Thomson's theory, conflict of interests is the set of conditions, in which professional decision about a primary goal (authenticity of the research or welfare of the patient) is influenced by a secondary interest (Cain et al. 2005). In the appendix of some journals, the authors are specifically requested to mention if the article has or has not COI form.

If there is a discrepancy between the interests of authors or interests of author(s) and organization supporting the research project, the term conflict will be used. Therefore, it is expected that authors converge their benefits of publication with each other, or disclose the COI of the research before publication (Ancker and Flanagin 2007; Bes-Rastrollo et al. 2013).

In 1998, two remarkable studies carried out by Stelfox et al. (1998) showed a positive association between authors and companies producing calcium channel blockers, with the article showing positive effects of the drugs. A vast number of articles have shown the importance of conflict of interests (Stelfox et al. 1998; Schott et al. 2010; Barnes and Bero 1998; Bekelman et al. 2003; Lexchin et al. 2003).

Researchers insist on the principle that readers of scientific articles should be aware of conflict of interests. Thereby, they can judge the studies based on more information (Ancker and Flanagin 2007; Friedmann and Richter 2004; Baethge 2008). However, some conflicts of interests are not reported in literature (Okike et al. 2009; Chimonas et al. 2011; Lieb et al. 2011; Kesselheim et al. 2012; MacKenzie and Rogers 2015; Eisner et al. 2015; Eisner 2015).

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Research also shows that conflict of interests uses flexible data analysis methods and reports of positive luck findings in both preventive research and related disciplines, including public health and psychology. However, the vast majority of published studies show positive results (Gorman 2016).

The International Association of Medical Editors requires magazines to address the issue of COI: if COI is not effectively managed, it can create writers, reviewers, and editors for decisions that they are consciously or unconsciously serving. It publishes competitive interests for its own responsibilities in the publishing process, and thus destroys the scientific organization. This result of the COI is particularly dangerous, because it is not immediately apparent to others. In addition, the emergence of COI, even if none really exists; it can rely on a magazine by damaging reputation and credibility (World Association of Medical Editors 2015).

The present concern, because of relationship and trust between patients and doctors, would increase on a daily basis, with unequal knowledge and power. Doctors are the stronger party fully trusted by a weaker party, i.e. the patients, especially when the patients are kids.

In general, society expects that doctors would not consider any incentives except the health of the patients in their efforts. The severity of the consequences of conflict of interests is of higher value when the patients' health is jeopardized as a result. In addition, conflict of interests might result in a change in attitudes and approach of other doctors and peers (MacKenzie and Rogers 2015; Baethge 2013; Schott et al. 2010).

Dentistry is one of the outstanding fields throughout the world and articles published in this field might be pursued not only by the researchers but by also the people. Ethics committees have the task of examining conflict of interests in many universities.

A recent survey showed that half of the respondents (dentists) are not aware of the guidelines of conflict of interests in dentistry (Schwartz et al. 2007). In addition, it might bring precariousness to scientific principles and researches, and it could also challenge general public's trust in scientific findings (Baethge 2013).

This study showed that only nine journals included COI form in their appendices, and 8 journals requested the authors to incorporate COI in the final section if they had any, and the rest did not mention it.

What the writers may declare as a COI depends on various factors. The most notable of which is the one included in the appendix of each journal. For instance, in a research on articles published in Germany by Baethge (2008), 0–30% of articles were reported with COI.

In late 2010, the International Committee of Medical Journal Editors published an updated version of COI form. One of the key benefits of the new format is that it includes closed questions. For example, after a brief introduction, it asks if there is relevant COI. The authors should check the table (yes or no) and express the COI. In addition, the new statement covers a wide range of COI potentials in both personal and institutional levels, such as scholarships, loyalties and non-economic COI (Tammy and Nicholas 2002; Drazen et al. 2010; ICMJE 2010).

Evaluation of articles showed that from 1021 articles in Persian, 128 articles cited that the research had no the declarations of COI, and 11 papers with COI at the

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end of the article. The COI included receiving treatment from the manufacturer (25 cases), institutional affiliation of the author (7 cases) and research funded by the drug company (13 cases). Of 1220 articles in English, 825 articles reported no the declarations of conflict of interests and 45 cases cited COI. It is found in the present research work that between 2010 and 2016, the number of articles that cited no COI is three times that the ones before 2010.

Kesselheim et al. (2012) reported recently that among all the articles written by experienced authors; only 15% cited the COI correctly. Although, other studies showed better level of disclosure of COI, the authors believe that there is a huge gap between disclosure of COI in these research studies and ideal disclosure of COI. There are many factors responsible for incorrect disclosure of COI. For instance, lack of sufficient knowledge of authors about COI could be a reason, or rather the authors might have forgotten the disclosure of COI or some authors might have incorporated false words in their articles.

Brignardello-Petersen et al. (2013) reviewed all the randomized clinical trials (RCTs) that were published in ten dental journals from July 2010 to June 2012 and had the most impact on dentistry. They showed no relationship between the positive results of the study and the field of activity.

Also, Papageorgiou et al. (2015) showed that in the field of dental prosthodontics and dental implants, the majority of studies showed led to statistically significant results. The same trend exists in other publications in dentistry.

Hakoum et al. (2017) searched on the Ovid Medline, including a randomized sample of 200 randomized controlled trials published in 2015 in one of the 119 core clinical journals. The researchers showed that more than half of the randomized controlled experiments were published by at least one author with COI. Researchers from the CFI court reported more financial than human institutions and individual COIs often from organized illegal organizations.

This study showed that 83% of studies with positive COI had a significant relationship in this field. However, in 73% of studies with no COI, there was a positive outcome. Davidson (1986) showed that 43% of the trials favored are funded by pharmaceutical firms. Of the 31 trials favoring traditional therapy, only four (13%) were supported by a pharmaceutical firm. There was a statistically significant association between the source of funding and the outcome of the study that is consistent with our study and other studies (Rochon et al. 1994; Kjaergard and Als-Nieslen 2002). In addition, Cho and Bero (1996) showed that significantly more articles with drug company support (98%; 39 of 40) than without drug company support (79%; 89 of 112) had outcomes favoring the drug of interest. However, Friedberg et al. (1999) did not identify any bias in individual studies, with their findings that pharmaceutical company sponsorship of economic analyses is associated with reduced likelihood of reporting unfavorable outcomes.

Harrison analyzed 135 published dental clinical trials and showed that articles with COI had 2.4 times more positive results compared to those without COI (Barnes and Bero 1997).

A study conducted by Clifford et al. (2002) (Juni et al. 2002) on five medical journals with high IF showed no documented relationship between the funding source,

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test result and report of drug quality in RCT journals, consistent with the results of studies by Djlbegovic et al. (2000) and Kjaergard et al. (1999).

Panagiotou and Ioannidis (2012) and Nosek et al. (2012) showed that there are also benefits to non-financial interests, such as the beliefs and predictions of individual scientists, and the extent to which researchers are able to achieve published results in order to advance their profession.

Pang et al. (2015) evaluated the relationship between the financial benefits and the characteristics, outcomes and methodological quality of controlled randomized trials of fibromyalgia. It was concluded that most of the treatments for fibromyalgia in randomized controlled trials are industry-sponsored, and at least one author had a financial disaster. After adjusting the sample size, no relationship was found between the industry budget or the financial benefits of the author and the results of the present study. Han and his colleagues showed that the financial relationships of the original researchers are independently associated with positive clinical results. These findings might lead to bias on the basis of evidence (Ruff 2015).

Although, the influence of the industry has become widespread throughout medicine, psychiatry is the subject of many disputes over the source of conflict and the source's interests. Among placebo-controlled studies in psychiatric journals that were randomly controlled and double-blinded, those reporting conflicts of interest were five times more likely to report positive outcomes (Every-Palmer and Howick 2014).

Piper et al. aimed to determine whether the authors of pharmacology textbooks have undisclosed financial COI and to identify author characteristics associated with COI. Their research showed that financial COI is common among the authors of pharmacology and pharmacotherapy textbooks. Full transparency of potential COI, particularly patents, should become standard procedure for future editions of educational materials in pharmacology (Piper et al. 2015).

The differences in this field might be attributed to various methodologies of studies. Undoubtedly, authors send their best articles to journals with high impact, and differences in results could be due to this fact. It is also possible that the disagreement between the results of the present study and other studies would be due to operational definition of the supporting agent. Studies have shown that drug manufacturing companies, and companies that produce medical and dental devices are very concerned about COI because an increase in research budget is subject to a positive report of influence of drugs or devices (Kesselheim et al. 2012).

In the health system, patients cannot have their own choice of treatment due to lack of knowledge; therefore, the doctors should make the patients aware of unnecessary treatments. Disclosure policies also depend on truthfulness of editors, writers, reviewers and colleagues, but even the best journals do not conform to international disclosure policies.

Conclusion

In general, the society expects that doctors would not consider any incentives other than the health of patients in their efforts. The severity of the consequences of

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conflict of interest is of higher value when the patients' health is jeopardized. In addition, conflict of interest might alter the attitude and approach of other doctors and peers.

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Compliance with Ethical Standards

Conflict of interest The authors have no competing interests to declare with regards to authorship and/or publication of this article.

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