

BMJ Open Conflict of interest between professional medical societies and industry: a cross-sectional study of Italian medical societies' websites

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ABSTRACT

Objective: To describe how Italian medical societies interact with pharmaceutical and medical device industries through an analysis of the information available on their websites.

Design: Cross sectional study.

Setting: Italy.

Participants: 154 medical societies registered with the Italian Federation of Medical-Scientific Societies.

Main outcome measures: Indicators of industry sponsorship (presence of industry sponsorship in the programme of the last medical societies' annual conference; presence of manufacturers' logos on the homepage; presence of industry sponsorship of satellite symposia during the last annual conference).

Results: 131 Italian medical societies were considered. Of these, 4.6% had an ethical code covering relationships with industry on their websites, while 45.6% had a statute that mentioned the issue of conflict of interest and 6.1% published the annual financial report. With regard to industry sponsorship, 64.9% received private sponsorship for their last conference, 29.0% had manufacturers' logos on their webpage, while 35.9% had industry-sponsored satellite symposia at their last conference. The presence of an ethical code on the societies' websites was associated with both an increased risk of industry sponsorship of the last conference (relative risk (RR) 1.22, 95% CIs 1.01 to 1.48 after adjustment) and of conferences and/or satellite symposia (RR 1.22, 95% CIs 1.02 to 1.48 after adjustment) but not with the presence of manufacturers' logos on the websites (RR 1.79, 95% CIs 0.66 to 4.82 after adjustment). No association was observed with the other indicators of governance and transparency.

Conclusions: This survey shows that industry sponsorship of Italian medical societies' conferences is common, while the presence of a structured regulatory system is not. Disclosure of the amount of industry funding to medical societies is scarce. The level of transparency therefore needs to be improved and the whole relationship between medical societies and industry should be further disciplined in order to avoid any potential for conflict of interest.

Strengths and limitations of this study

- To the best of our knowledge, this is one of the first assessments of the relationship between Italian medical societies, and pharmaceutical and medical device industries.
- A systematic approach was used to explore the medical societies' websites; data on societies' policies on governance and transparency were independently collected by two coders.
- With regard to the limitations, we relied only on information disclosed in the medical societies' websites, without any further Internet searches, nor did we perform a quality assessment of the websites.
- The study has an Italian focus and we acknowledge that an international comparison would have been required in order to ensure generalisability of our findings.

INTRODUCTION

Professional Medical Societies play an important role in advancing the quality of medical care through the development of clinical practice guidelines that shape clinical practice, dissemination of information through the publication or sponsorship of a journal, funding of research projects, and the organisation of educational conferences and continuing medical education (CME) events.^{1 2} Moreover, medical societies advocate for the interest of their practitioners as the 'voice of the profession'.³

Pharmaceutical and medical device industries both extensively fund several activities carried out by medical societies.^{1 2} Industries, especially, subsidise annual meetings and CME events, purchasing advertising space, funding physicians' attendance to these courses and sometimes, as the Institute of Medicine (IOM) points out, influencing the 'choice of topics and content'.⁴



During the past decades, extensive literature has investigated the relationship between physicians, and both, pharmaceutical and medical device industries, and has shown that some kinds of interaction could unduly influence professional judgements, leading to the potential for bias and conflict of interest (COI).^{4 5} A growing body of literature has also investigated the issue of COI applied to medical societies rather than to individual physicians and some researchers have made important recommendations for change.^{1-3 6-8} Particularly, strong recommendations have been made with regard to industry sponsorship of congresses due to the possibility of the sponsor to bias the educational content of the event thus influencing doctors' prescribing habits.¹ Changes have been proposed also for the organisation of satellite symposia: current recommendations suggest clearly marking them as industry sponsored sessions and keeping them separated, both in space and time, from the main event they parallel.¹ Following these recommendations, several medical societies have adopted specific institutional policies governing their relationships with industry.⁹⁻¹² However, these are mainly US-based articles and case studies while little is known about the relationships between industry and medical societies in Europe, and particularly in Italy, where this topic is still quite a grey area of research. To the best of our knowledge, only one recently published study has investigated the level of transparency in Italian medical societies, focusing on obstetrical and gynaecological associations. Vercellini *et al*¹³ found that transparency regarding sponsorship and competing interests was almost non-existent.

The present study aims at describing how Italian medical societies interact with pharmaceutical and medical device industries through an analysis of the information available on their websites. In particular, we aim to provide a description of the societies' policies on transparency and governance, and of the extent of industry sponsorship on their activities. Furthermore, we explore possible associations between medical societies' policies on transparency and governance, and their practices in terms of industry sponsorship of educational events.

METHODS

Study design and data collection

In order to explore the relationship between Italian medical societies, and pharmaceutical and medical device industries, we carried out a cross-sectional study. We searched the websites of all medical societies registered with the Italian Federation of Medical-Scientific Societies (FISM) between January and September 2014. The Federation includes those societies operating in the medical or scientific field that are involved in research or professional medical education activities and that have been operating in Italy at the national level for at least 3 years.¹⁴ It is also worth mentioning that Italian medical societies are regulated by a Law Decree that was

approved by the Ministry of Health in May 2004.¹⁵ These are some of the criteria Italian medical societies need to meet in order to be officially recognised by the Ministry of Health:

- ▶ Operating at the national level and physically present in at least 12 Italian regions;
- ▶ Represent at least 30% of the health professionals working in that particular field;
- ▶ Are a non-profit organisation;
- ▶ Have a statute;
- ▶ Organise CME activities and are in collaboration with the Ministry of Health, with funding of research projects and development of guidelines in collaboration with other institutions being listed among their main activities.

From each medical societies website we collected the following information (yes/no questions):

- ▶ Whether the medical society's statute mentioned the issue of COI (by statute we mean the official document that contains the rules of conduct of the society, describes its organisational structure and states its purposes);
- ▶ The presence of an ethical code, defined as a document specifically developed to regulate medical society's behaviour in case of industry sponsorship;
- ▶ The publication of their annual financial report on the website;
- ▶ The presence of pharmaceutical or medical device companies' logos on their homepage;
- ▶ The presence of pharmaceutical or medical device industry sponsorship in the programme of the medical society's last annual conference;
- ▶ The presence of industry sponsorship of satellite symposia during the last annual conference.

With regard to the last two criteria, by last annual conference we mean an event that had been organised within the previous 12 months; this was also considered a proxy of how updated the websites were. In order to define industry sponsorship, we looked at whether the manufacturers' names and/or logos were explicitly listed as 'sponsors' in the programme of the conference.

Data were independently extracted by five trained medical residents in public health and one trained medical student, with duplicate independent coding of all data. A systematic approach was used to explore the websites and collect data on the medical societies' policies on governance and transparency. After the data collection, coders met to resolve disagreements and reach consensus. Statistical analyses were performed using the final information obtained after consensus. All analyses were performed using Stata V.12.1 SE.

Statistical analyses

Our main purpose was to provide a detailed descriptive analysis of the relationship between Italian medical societies, and the pharmaceutical and medical device industries. Categorical variables were described using frequency tables. Cross tabulations were performed for

evaluating possible associations between industry sponsorship in the programme of the last congress, industry sponsorship of satellite symposia and presence of manufacturers' logos on medical societies' websites, using χ^2 or Fisher exact test, as appropriate.

As a second step, we aimed to explore the relationship between medical societies' regulatory systems in terms of policies on governance and transparency (ie, the presence of an ethical code, the presence of a statute covering relations with industry, the publication of the annual financial report on the website), and their actual behaviours. Our main outcome was the presence of pharmaceutical or medical device industry sponsorship in the programme of the last annual conference. Moreover, while recognising that the conference sponsorship might be considered a stronger sign of corporate influence, satellite symposia—if not sufficiently regulated as proposed by Rothman—as well might undermine the scientific integrity of the main meeting they parallel.¹ Therefore, we performed sensitivity analyses evaluating the combined outcome of having industry sponsorship in the programme of the last annual conference and/or of satellite symposia.

As a secondary outcome, we explored the relationship between medical societies' regulatory systems and the presence of industry logos on medical societies' websites. Possible predictors were the presence of an ethical code, of a statute regulating COI and the publication of the annual financial report on the website.

Medical societies were divided into three main categories (surgical—those for which the main activity is a surgical intervention on the patient, eg cardiosurgery; clinical—those for which the main activity is to provide non-surgical treatment to the patients, eg cardiology; services—those for which the main activity is to

support/make possible the activities of the previous areas, eg radiology, hygiene and public health, forensic medicine), according to the official definition provided by the Italian Ministry of Education, Universities and Research,¹⁶ which was used as adjustment variable (categorical) together with the societies' dimension (continuous). We performed stratified analyses within each specialty in order to identify possible differences between the three groups. Our hypothesis was that pharmaceutical and medical device industries would target their marketing activities to certain medical specialties more than others; for example, those societies belonging to the clinical and surgical specialties—where doctors have more prescribing power—might have more financial ties with manufacturers compared with the service category.

Owing to the high prevalence of industry sponsorship in the programme of the last annual conference, we used Poisson regression to estimate relative risks (RR).¹⁷ Results are presented as RR with 95% CI.

RESULTS

A detailed description of the medical societies included in the survey can be found in [table 1](#).

Type of societies

In 2013, 154 Medical Societies were registered with FISM, 23 of which were excluded from our analysis because information on the outcome was not available (ie, the website was not accessible or it was not possible to retrieve a detailed programme of the last annual conference). No differences were observed between the included and the excluded societies ($p=0.565$ for the type of society, $p=1.000$ for the presence of an ethical

Table 1 Description of professional medical societies included in the survey

	All sample (n=131) N (%)	Only services (n=42) N (%)	Only medical (n=59) N (%)	Only surgical (n=30) N (%)
Transparency and governance				
Ethical code covering relations with industry	6 (4.6)	1 (2.4)	2 (3.4)	3 (10.0)
Statute covering relations with industry	60 (45.8)	16 (38.1)	32 (54.2)	12 (40.0)
Annual financial report on website	8 (6.1)	2 (4.8)	3 (5.1)	3 (10.0)
Industry sponsorship				
Manufacturers' logos on the website	38 (29.0)	10 (23.8)	15 (25.4)	13 (43.3)
Industry sponsorship in the programme of the last annual conference	85 (64.9)	24 (57.1)	41 (69.5)	20 (66.7)
Industry sponsorship of satellite symposia	47 (35.9)	17 (40.5)	23 (39.0)	7 (23.3)
Industry sponsorship in the programme of the last annual conference OR satellite symposia	88 (67.2)	26 (61.9)	42 (71.2)	20 (66.7)
Dimension				
<500 affiliates	55 (42.0)	19 (45.2)	18 (30.5)	18 (60.0)
501–1000 affiliates	20 (15.3)	6 (14.3)	13 (22.0)	1 (3.3)
1001–2000 affiliates	19 (14.5)	7 (16.7)	12 (20.3)	0 (0.0)
2001–4000 affiliates	11 (8.4)	4 (9.5)	2 (3.4)	5 (16.7)
>4000 affiliates	8 (13.7)	1 (2.4)	4 (6.7)	3 (10.0)



code, $p=0.600$ for the presence of the annual financial report on their website, $p=0.334$ for the presence of manufacturers' logos on their website, $p=0.251$ for the society dimension. Owing to the absence of the programme of the last annual conference, neither this outcome nor the presence of industry-sponsored satellite symposia could be tested). With regard to the 131 medical societies included in our study, 42 (32.1%) were from the services, 59 (45.0%) from the clinical and 30 (22.9%) from the surgical area. A detailed description of the medical specialties represented in each group is provided in online supplementary file 2. With regard to the dimension, 57.3% of the societies had <1000 affiliates.

Transparency and governance

Only 4.6% of the medical societies had an ethical code covering relations with industry on their websites, while less than half (45.6%) of the statutes mentioned the issue of COI, and only 6.1% published the annual financial report.

Industry sponsorship

Almost one-third (29.0%) of medical societies had manufacturers' logos on their webpage, with the highest frequency registered in the surgical category (43.3%). Two-thirds (67.7%) of medical societies had either their last conference or satellite symposia sponsored by industry; in particular, 64.9% of these had industry sponsorship of their last conference, while 35.9% had industry-sponsored satellite symposia at their last conference. Satellite symposia were always organised within the conference, and were held either in series or parallel to the main session. This means there was no clear separation in time, as mentioned by Rothman.¹ As for the separation in space, in most cases it was impossible to retrieve this information from the conference programme, since locations were not always listed.

We observed an association between having industry sponsorship of the last conference and of satellite symposia (χ^2 test: $p<0.0001$), but not between having a private sponsorship of the last conference and the presence of manufacturers' logos on the websites ($p=0.132$).

Relationship between medical societies' policies and funding of annual meetings

Table 2 summarises the findings of an exploratory analysis on the association between medical societies' policies on transparency and governance, and the industry sponsorship of their last annual conference.

Within the whole sample, interestingly, the presence of an ethical code on the societies' websites was associated with an increased risk of industry sponsorship of the last conference (crude RR 1.39, 95% CIs 1.23 to 1.57; RR 1.22, 95% CIs 1.01 to 1.48 after adjustment). The presence of a statute covering relations with industry showed no association with the risk of having the last conference sponsored by industry when looking at both

the crude (RR 1.16, 95% CIs 0.91 to 1.47) and the adjusted RR (1.17, 95% CIs 0.89 to 1.53). The absence of the annual financial report on the website did not show any association with industry sponsorship of the last conference either (crude RR 1.29, 95% CIs 0.67 to 2.48; adjusted RR 1.22, 95% CIs 0.72 to 2.08). Interestingly, the society dimension was associated with an increased risk of industry sponsorship of the last conference (crude RR 1.14, 95% CIs 1.06 to 1.22; RR 1.13, 95% CIs 1.05 to 1.21 after adjustment), while no association was observed with the type of society.

Finally, we observed no specific pattern between the presence of a statute covering relations with industry, the presence of an ethical code or financial transparency, and the risk of industry sponsorship within each type of society, despite finding an increased risk of industry sponsorship associated with the presence of an ethical code within the clinical group.

When we repeated the analysis, using the composite outcome, 'private sponsorship of the last conference or satellite symposia', no major differences were observed (online supplementary file 1).

Relationship between medical societies' policies and presence of manufacturers' logos on the website

Table 3 shows the results of an exploratory analysis on the association between medical societies' policies on transparency and governance, and the presence of manufacturers' logos on their websites. No association with presence of manufacturers' logos was observed either in presence of an ethical code or of a statute covering relations with industry.

DISCUSSION

To the best of our knowledge, this is one of the first assessments of the relationship between Italian medical societies, and pharmaceutical and medical device industries. We provided an overview of the type of industry support and of the policies implemented by medical societies in order to face the issue of COI, showing how common the industry sponsorship of medical events is and how uncommon the presence of a structured regulatory system is.

Transparency

According to the data presented in table 1, there seems to be a general lack of transparency: only 6.1% of all the societies included in our study shared information on their financing. Since medical societies are not required to disclose this information, the amount of industry funding is often unknown. Full disclosure and complete transparency in the relationship between industry and medical societies is a fundamental step for the credibility of both, and the US Physician Payments Sunshine Act sets an interesting precedent.¹⁸ Italy does not currently have transparency laws that are similar to the Sunshine Act. However, it is worth noticing that the European

Table 2 Relative risks of having pharmaceutical or medical device industry sponsorship in the programme of the last medical societies' annual conference

	Main model		Stratified analysis					
	All sample (n=131)		Only services (n=42)		Only clinical (n=59)		Only surgical (n=30)	
	Crude RR	Adjusted RR	Crude RR	Adjusted RR	Crude RR	Adjusted RR	Crude RR	Adjusted RR
Ethical code	1.39 (1.23 to 1.57)	1.22 (1.01 to 1.48)	1.74 (1.33 to 2.28)	0.66 (0.42 to 1.04)	1.23 (1.07 to 1.41)	1.28 (1.04 to 1.59)	1.29 (1.03 to 1.63)	1.33 (0.88 to 2.01)
Statute	1.16 (0.91 to 1.47)	1.17 (0.89 to 1.53)	1.67 (0.94 to 2.94)	1.48 (0.81 to 2.70)	0.86 (0.67 to 1.12)	0.86 (0.59 to 1.23)	1.18 (0.74 to 1.89)	1.28 (0.74 to 2.19)
No annual financial report on website	1.29 (0.67 to 2.48)	1.22 (0.72 to 2.08)	1.28 (0.31-0.32)	1.80 (0.65 to 4.94)	1.71 (0.42 to 6.96)	1.65 (0.33 to 8.19)	1.17 (0.50 to 2.73)	0.95 (0.67 to 1.32)
Dimension of society	1.14 (1.06 to 1.22)	1.13 (1.05 to 1.21)	1.29 (1.09 to 1.53)	1.28 (1.02 to 1.61)	1.09 (0 to 98 to 1.21)	1.11 (0.01 to 6.03)	1.08 (0.99 to 1.18)	1.08 (0.25 to 1.67)
Type of society								
Services	1	1	–	–	–	–	–	–
Clinical	1.40 (1.05 to 1.87)	1.22 (0.89 to 1.78)	–	–	–	–	–	–
Surgical	1.31 (0.94 to 1.84)	1.32 (0.94 to 1.84)	–	–	–	–	–	–

Bold typeface indicates significant results.

Table 3 Relative risks of having manufacturers' logos on medical societies' websites

	Main model		Stratified analysis					
	All sample (n=131)		Only services (n=42)		Only clinical (n=59)		Only surgical (n=30)	
	Crude RR	Adjusted RR	Crude RR	Adjusted RR	Crude RR	Adjusted RR	Crude RR	Adjusted RR
Ethical code	1.79 (0.76 to 4.21)	1.79 (0.66 to 4.82)	2.27 (0.49 to 9.93)	10.52 (0.53 to 206.83)	2.11 (0.48 to 9.27)	2.72 (0.61 to 12.19)	0.72 (0.13 to 3.88)	0.92 (0.27 to 3.14)
Statute	0.97 (0.53 to 1.75)	1.21 (0.62 to 2.35)	1.67 (0.42 to 6.52)	1.64 (0.31 to 8.59)	0.96 (0.38 to 2.41)	1.16 (0.33 to 4.07)	0.71 (0.27 to 1.91)	0.84 (0.33 to 2.12)
No annual financial report on website	NC	NC	NC	NC	NC	NC	NC	NC
Dimension of society	0.96 (0.77 to 1.19)	0.92 (0.72 to 1.19)	1.03 (0.69 to 1.55)	0.74 (0.28 to 1.96)	1.19 (0.83 to 1.69)	1.27 (0.84 to 1.91)	0.78 (0.56 to 1.09)	0.74 (0.27 to 3.13)
Type of society								
Services	1	1	–	–	–	–	–	–
Clinical	1.09 (1.54 to 2.18)	1.97 (0.41 to 2.32)	–	–	–	–	–	–
Surgical	1.82 (0.92 to 3.60)	1.99 (0.89 to 4.43)	–	–	–	–	–	–

NC: non calculable because of 0 count cells: no societies with an available annual financial report showed a logo on their website.

Federation of Pharmaceutical Industries and Associations (EFPIA), the representative body of the pharmaceutical industry in Europe, adopted a 'Disclosure Code' in 2013.¹⁹ According to the Code, starting from 2016, EFPIA member companies will make details of certain payments made to healthcare professionals and healthcare organisations public. While supporters of industry self-regulation welcome this effort, some authors point out that self-regulatory transparency measures might be a tactic the pharmaceutical industry is pursuing to prevent government-imposed transparency.²⁰ We therefore urge Italian governmental agencies to require a public disclosure of manufacturers' funding to physicians, medical societies and health care providers, and to strictly monitor the completeness, accuracy and accessibility of the information provided.

However, even if transparency is the main strategy internationally adopted to face the issue of COI, it seems to have some limits. According to our data, even when medical societies are more transparent, this does not seem to be associated with a decreased level of industry sponsorship of their conferences (see the following paragraph for further discussion on the relationship between policies and practices). This leads to a reflection on the limits of the strategies to address COI that focus merely on transparency. Even if the disclosure makes others aware of the presence of a COI, it does not seem to be sufficient protection and, according to some authors, it might also have 'significant adverse effects' through several mechanisms such as creating the wrong feeling that once the COI is declared, there is no need to manage it.^{12 21} As Loewenstein²¹ points out, the issue to be considered 'should not be whether to disclose but how to ensure that disclosure has its intended effects'.

Relationship between policies and practices

We conducted an exploratory analysis on the association between medical societies' policies and their consequent behaviours in terms of industry sponsorship in the programme of the last annual conference, and presence of manufacturers' logos on their websites. We found that the presence of an ethical code on the societies' websites is associated with both an increased risk of industry sponsorship of the last conference and of conferences and/or satellite symposia but not with the presence of manufacturers' logos on the websites. No association was observed with the other indicators of governance and transparency.

There could be two different interpretations of these data and, due to the cross-sectional nature of our study, meaning the study is not meant to establish causal relationships, neither interpretation can be excluded.

On one hand, it seems that the societies with higher level of industry sponsorship of their conferences are more likely to have ethical codes, and this might be expected because having these relationships with manufacturers, they could feel a need to govern the

relationships. Therefore, the regulation might be a consequence of their relationship with industry. However, another possible explanation might be that the societies with an ethical code tend to be more transparent, and thus are more likely to disclose industry sponsorship when it actually occurs.

Whatever the direction, it seems that the presence of a regulation or ethical code does not decrease the level of industry sponsorship. There could be different explanations for this phenomenon: first, codes and regulations may not be stringent or effective enough to prevent—or at least manage—the COI. Second, there may be a lack of monitoring and vigilant enforcement of these guidelines once they are developed. It is also worth pointing out that we evaluated whether medical societies mentioned the issue of COI but did not analyse how they conceived it, therefore there might be different definitions of COI in their ethical codes or statutes. However, although it was not an objective of this study, it is worth emphasising that, in reviewing medical societies' statutes and ethical codes, we generally found no clear definitions of COI and, except for a few cases with very detailed regulation, there was usually quite a general reference to the issue.

Looking at the actual behaviour of medical societies, namely, how common is the industry sponsorship of their conferences, it is worth questioning whether there is any perception that industry sponsorship of an educational event itself creates a COI. As several authors state, COI is a condition and not necessarily a behaviour, and the bias created by COI is often very subtle, unconscious and unintentional.²² A growing amount of literature has also shown that industry-sponsored educational events are biased toward the product of the sponsor and might influence physicians' prescribing habits.^{23 24} Looking at how common the industry sponsorship of medical events in our sample is, it does not seem that this is perceived as a COI situation that might undermine the integrity and independence of medical societies.

Finally, our initial hypothesis that societies in the services field might be less prone to industry-sponsorship was not confirmed. According to our data, the number of society members is a more important determinant of industry sponsorship of medical events, as might be expected, because it provides a larger target audience.

What can be done

Public disclosure of financial relationships between physicians, medical societies, healthcare providers and manufacturers is, of course, a needed step and we call on our government to make it a mandatory requirement. However, in order to face such a problem we need to be bold enough to rethink the whole relationship between physicians, medical societies and industry.

Several proposals and recommendations have already been made, from a total ban on manufacturers' funding, to thresholds for the level of industry sponsorship that can be considered acceptable, to pooled funds

administered through a central repository.^{1 12} With regard to educational events, committees in charge of programme content should be completely free of financial ties to industry, no manufacturers' logos should appear on the conference materials and conference organisers should clearly label any industry-sponsored symposia.¹

We recognise that all these proposals—both the softer and the more stringent ones—will require a huge cultural change, but it is time to start demythologising some of the most accepted paradigms such as the idea that it is not possible to organise medical education events without any industrial sponsorship.²⁵ There are already examples of medical societies that have made interesting and bold attempts both at the national and at the international level.^{9 10 12} With regard to Italy, it is worth highlighting that the Pediatricians' Cultural Association (Associazione Culturale Pediatri, ACP), the Italian Society of Migration Medicine (Società Italiana Medicina delle Migrazioni, SIMM) and the Italian Secretariat of Medical Students (Segretariato Italiano Studenti di Medicina, SISM), the biggest association of Medical students in Italy, have adopted stringent ethical codes on COI and have been organising their annual conferences without industry sponsorship.^{26–28} These few but extremely positive examples could provide a template for other medical societies to transform their mode of operation and to 'reduce commercialism and restore professionalism to our medical meetings'.⁸

Limitations

Our study has a number of limitations. First, this is a cross-sectional study, and as so it is not intended for establishing causal relationships. We can only describe the associations we observed but cannot exclude those that are spurious, nor state whether industry sponsorship is the result of the absence of an ethical code regulating COI or vice versa. Moreover, we decided to rely only on information disclosed in the medical societies' websites, without any further Internet searches, and we did not perform a quality assessment of the websites. It is possible that those that designed a low quality or not well-structured website were more likely to underestimate the importance of publishing an ethical code or a statute, but actually had one, rather than those that set up a well structured or better updated website. Therefore, we cannot exclude a certain amount of imprecision in our results. Moreover, we did not quantify the proportion of funding given by industry on the total amount of funds, which could be an important indicator of their independence from the sponsor. Also, in order to group the medical societies, we used the categorisation provided by the Italian Ministry of Education, Universities and Research. As previously mentioned, our hypothesis was that the influence of pharmaceutical and medical device industries may be stronger on those societies where the prescribing power of doctors is higher (ie, clinical and surgical specialties). However, this was not confirmed.

Finally, the results of our exploratory analyses (tables 2 and 3 and online supplementary file 1) are somewhere heterogeneous. It seems as though the presence of regulations (eg, the ethical code) has a certain association with industry sponsorship of annual conferences (table 2) and with the organisation of industry-funded conferences and/or satellite symposia (see online supplementary file 1), but not with the presence of manufacturers' logos on societies websites (table 3). It might be that showing manufacturers' logos is not perceived as a possible source of COI, and is therefore not regulated, or, conversely, since doing so is not regulated, there is no perceived need to eliminate the logos from the websites. We think this point requires further investigation in order to examine the kinds of financial relationships that may be hidden behind the presence of manufacturers' logos on medical societies' websites.

With regard to the generalisability, our study focused on Italian medical societies, and particularly only on those affiliated to the Italian Federation of Medical-Scientific Societies. It is possible that these societies are more virtuous than those not affiliated to the Federation, or the other way around, therefore we cannot conclude that this situation is common to all Italian medical societies. However, Italian medical societies voluntarily decide to become members of the Federation, therefore we are quite confident of our results. Despite these limitations, and considering the data from previous studies,^{1 2} we believe that our results may be relevant also to other countries.

CONCLUSIONS

The interaction between medical societies and industry has come under increasing scrutiny over the past decades. While recognising the importance of appropriate forms of collaboration between physicians and pharmaceutical industries, we strongly believe that, as Schofferman states, the potential values of these collaborations do not mitigate their potential risks: these relationships 'are conflicted by their very nature and have the potential to create unconscious bias that might influence patient care'.¹²

We hope our analysis of the current Italian medical societies' relationship with industry might be a first step in order to stimulate a reflection on this controversial issue in our country. In this perspective, we aim to use this survey as an advocacy tool for a debate that we, as residents and doctors in training, would like to launch among our medical societies.

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Contributors AF, DT, FN, AL, FG and AR conceived the study. AR designed the data collection tool and coordinated the data collection. FF, FG, DI, CL, ES and AR collected the data. GG, AR and AF planned the statistical analysis and GG analysed the data. AF, GG and AR wrote the first draft of the paper. DT, FN and AL contributed to the writing of the paper. All the authors critically revised the manuscript and approved the final version. AF is guarantor.

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