

The Accuracy of Psychiatric Medication Advertisements in Medical Journals

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Abstract: Psychiatric medications are frequently advertised in medical journals, yet no study has addressed the veracity of claims made in these advertisements. The present study examined the accuracy of 69 medical journal advertisements for psychiatric medications and the availability of sources cited in these advertisements. Just over half of claims made in advertisements (50.2%) provided no attainable source that could be used to check the veracity of the claim. When sources were attained, they supported the cited claims 65% of the time (95% CI: 61.0–69.1). Claims regarding the efficacy of medications were only supported by obtained cited sources on 53.2% of occasions (95% CI: 46.2–60.2). Attempts to obtain cited data on file from sponsoring drug companies were rarely successful. Given the relatively poor empirical substantiation of claims made in medical journal psychiatric drug advertisements and that most claims provided no attainable sources, increased regulation of such advertising is warranted.

Key Words: Medical journal policy, psychiatric medication advertising, marketing.

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Pharmaceutical advertising in medical journals exists to persuade medical practitioners to prescribe drugs. Some claim that drug advertisements also serve to educate health professionals about the benefits and risks of treatment (Dubois, 2003; PhRMA, 2002). If medical journal advertisements are to serve a helpful educational purpose, then they should provide accurate information. However, a handful of studies have investigated the accuracy of claims made in medical journal drug advertisements, each finding that drug ads often provide incomplete or misleading information. For example, one study found that 69% of claims made in

Spanish medical journals regarding antihypertensive medications were not supported by their cited sources, and that 20% of claims for lipid-lowering drugs were similarly not supported (Villanueva et al., 2003). Another investigation of advertising in a Dutch medical journal found that 35% of advertisements for antihypertensive medication contained claims not supported by evidence (Greving et al., 2007). Advertising in rheumatology journals was also found to be frequently poorly supported by its cited sources (van Winkelen et al., 2006). Studies of medical journal advertising in Finnish medical journals (Lankinen et al., 2004) and in orthopedic journals have yielded similar findings (Bhattacharyya et al., 2003).

Additionally, 2 studies found that the statistical data provided in medical journal advertisements were almost entirely lacking in providing sufficient statistical data relevant to clinical practitioners (Gutknecht, 2001; Loke et al., 2002). Other researchers (Wilkes et al., 1992) reported that over nine tenths of drug advertisements appearing in medical journals appeared to violate advertising standards set by the Food and Drug Association (FDA). Making it more difficult to ascertain the veracity of their claims, advertisements often cite data on file or provide no reference whatsoever to support advertising claims (Cooper and Schriger, 2005; Loke et al., 2002; Mindell and Kemp, 1997; Smart and Williams, 1997; Villanueva et al., 2003), and when asked to provide data on file, companies are often unwilling to comply (Cooper and Schriger, 2005).

Though peer-reviewed research on the impact of medical journal advertising is quite sparse, results from industry studies suggest that journal advertising is a solid investment for drug companies. Surveys found that nearly 80% of physicians labeled as “high prescribers” rated journals as an important source of information (Paul and May, 2004) and 80% of primary care physicians likewise viewed medical journals as an important source of information (Accenture, 2003). Both groups rated medical journals as an important source more frequently than any other source of information. Given that physicians report high reliance on journals, it is unsurprising that two thirds of physicians report weekly exposure to journal ads (PERQ/HCI 1998, as cited by Association of Medical Publishers, undated).

Regarding the influence of medical journal advertising, one large study found that 1 dollar spent on journal advertising was linked to a return on investment of between \$2.30 and \$12.20, depending on the type of drug advertised. Journal advertising often provided a greater return on investment than detailing visits, direct to consumer advertising, or physician meetings and events (Wittink, 2002). Another inquiry found that

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the average return on investment from journal advertising was \$5.00, higher than for any other form of advertising studied (http://www.rxpromoroi.org/rapp/exec_sum.html, undated). Other research indicated a journal advertisement, which had scored well on a pretest was linked to a higher rate of new prescriptions for the drug after the launch of a journal advertising campaign while another advertisement that was poorly received did not influence new prescription rate (Hunt, 2005). Although the findings linking drug advertising to increased prescriptions have not been peer-reviewed, there is reason to have faith in such results, as it is unlikely that drug companies would spend nearly a half-billion dollars annually (IMS Health, 2007a) on a form of advertising that yields poor returns.

Anecdotally, a medical publishing trade group plans to feature advertisements in a group of trade magazines which “show an illustration of a sales representative, surrounded by anthropomorphic, boxing gloved journals, and the copy: Today’s office can be hard on reps. Don’t send them in there without journal advertising.” The titles of the pugilistic journals are set to rotate in the advertisement, which is forecast to run for a year (Arnold, 2007).

Research has yet to specifically address medical journal advertisements for psychiatric advertisements, which is a curious omission, given the wide use of such medications. In 2006, antidepressants were the most prescribed drug class in the United States (IMS Health, 2007b), and accounted for \$13.5 billion in U.S. sales and \$20.6 billion in global sales, while antipsychotics accounted for \$11.5 billion in US sales, and \$18.2 billion in global sales (IMS Health, 2007c,d); additionally, 3 of the 10 bestselling medications worldwide were psychiatric medicines (IMS Health, 2007e).

The present study examined the degree to which claims made in psychiatric medication journal advertisements were supported by their cited sources, as well as the availability of said sources. The degree to which sponsoring companies responded to requests for data on file was also investigated.

METHODS

Study Overview

We attempted to locate a wide sample of advertisements for psychiatric medications across reputable journals. After attaining a large sample of advertisements, we completed the following steps for each advertising claim made in each advertisement:

1. Each claim was coded into a specific type.
2. We examined whether the claim cited 1 or more sources.
3. Sources linked to the claim were gathered, provided such sources were attainable according to our criteria.
4. Based on our criteria, we coded whether each advertising claim associated with a cited source was supported by its source.
5. Data on file cited by advertising claims were requested.
6. Using the same criteria mentioned in step 4, we coded advertising claims linked to data on file obtained in step 5 for accuracy.

Selection of Advertisements

To obtain advertisements from journals that were of interest to both mental health specialists as well as a wide variety of other physicians, we obtained psychiatric drug and device advertisements from both psychiatry and general medicine titles. To assure that the selected journals were highly reputable, we selected the two psychiatry journals (*Archives of General Psychiatry* and *American Journal of Psychiatry*) and the two general medicine journals (*New England Journal of Medicine* and *Journal of the American Medical Association*) with the highest impact factor in their respective fields as of June 2006 (Thomson Scientific, 2007). To obtain a comprehensive sample, we examined each psychiatric medication and device (e.g., vagus nerve stimulation) advertisement that appeared during the year 2005 in these journals.

We examined only unique advertisements; if an advertisement appeared multiple times, we only coded its claims once. Advertisements that contained no relevant claims were not coded for accuracy. As the present study was a review of printed advertisements, it was exempt from human subject review.

Evaluation of Claims

Claims made in the advertisements were coded into types, as follows: efficacy (e.g., symptoms are improved), safety (e.g., low incidence of side effects), disorder (e.g., the disorder is linked to poor outcomes), mechanism of action, popularity (e.g., drug is frequently prescribed), convenience (e.g., convenient dosing), and other (did not relate to any above category). Only 1 claim addressed cost, which we coded under efficacy, as we believe that cost-effectiveness can be sensibly included under the broad rubric of efficacy. Claims made in the headline of advertisements (generally in large print at the top of a page) were not included in our tally of advertising claims unless they were linked to a source, which occurred quite infrequently. We did not evaluate these “headline” claims because they were generally quite vague and we viewed them more as advertising slogans (e.g., “In the treatment of ADHD, aim higher” or “Steady state of mind”) than specific claims regarding the advertised product. Each claim was independently coded into one of the aforementioned types by 3 reviewers, including an assistant professor of psychology and 2 advanced undergraduate students. Disagreements were resolved through consensus.

We attempted to locate all sources which were cited in support of an advertising claim. To obtain sources, various library databases were used (e.g., Medline, PsycInfo), as well as internet searches (www.google.com). All sources that were obtained through library resources or online searches were labeled as initially attainable sources. Data on file and other sources, such as reports from various data tracking agencies (e.g., Verispan, IMS Health) which were unavailable through our initial searches were labeled as initially unattainable sources. We did not attempt to attain reports from data tracking agencies, as these data were difficult to locate and we did not have funding to purchase such reports.

As data on file were cited frequently as a source, we attempted to obtain such data via a mailed request, using methods very similar to Cooper and Schriger (2005). We mailed letters to each company that cited data on file in at

least 1 advertisement and asked to receive data on file relevant to the claims made in their advertisements. If a specific report was mentioned in an advertisement (e.g., “Drug Company Study DRUG-137-A”), we requested the specific document by number. If generic data on file were cited, we included information about the journal title and issue in which the advertisement appeared in our request. A variety of aliases and addresses were used so that no single company received more than 1 request from the same individual or same address.

To standardize assessment of accuracy, a set of criteria was developed and applied to each claim. If a claim was highly specific, then the accuracy of the claim was evaluated directly. For example, the following claim is quite specific, so raters evaluated whether the *p* value stated in the claim was an accurate depiction of the cited source: “. . . [drug] treated patients also demonstrated significantly higher functional ability versus placebo over time as measured by ADCS-ADL (*p* = 0.003).” For less specific claims of efficacy, such as “[drug] 10 mg/d is effective in the treatment of depression,” claims were coded as supported if the advertised drug was superior to a statistically significant extent over placebo or a comparison medication on at least 1 relevant outcome measure. Coding was similarly done regarding safety claims, for which nonspecific claims, such as “low weight gain with monotherapy” were coded as supported if there was not a statistically significant difference favoring placebo on the referenced safety outcome. Claims coded as disorder, convenience, popularity, and “other” were rated for accuracy using similar methods. For over 90% of claims, 3 raters independently coded each claim for accuracy. For claims linked to data on file obtained from drug/device companies (less than 10% of claims for which we attained pertinent sources), 2 raters (G.I.S., S.A.T.) evaluated the claims for accuracy. Disagreements were resolved through reviewing the material and reaching consensus. The intraclass correlation coefficient for the ratings across the 3 reviewers was 0.901, indicating high levels of agreement across judges. Before coding claims for accuracy, the 3 reviewers examined a handful of sample claims linked to sources to provide training on the application of coding criteria used in the present study.

Statistics were calculated using SPSS, version 14. The primary outcome was the percentage of advertising claims supported by their cited sources. Secondary outcomes included: the percentage of claims not linked to an attainable source; the percentage of claims supported by peer-reviewed sources when such sources were cited; the percentage of claims supported within each subtype of advertising claim; the frequency with which requests for data on file were provided; and the percentage of claims citing data on file which were supported by data on file provided by drug/device companies.

RESULTS

Frequency of Advertisements

A total of 69 unique advertisements were collected, of which 53 made promotional claims relevant to our coding scheme. In the 53 ads that provided at least 1 claim, an average of 6.2 claims were made, with a range of 1 to 24

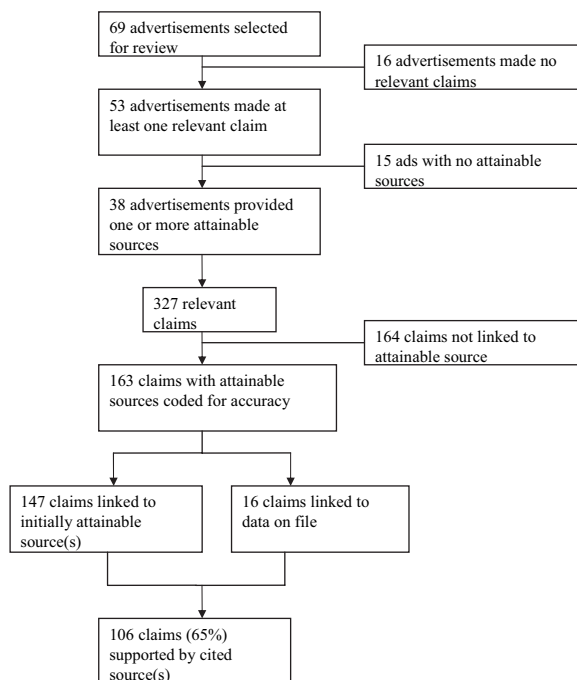


FIGURE 1. Flow diagram of advertising claims coded for accuracy.

claims. Of the advertisements that made relevant promotional claims, 38 (71.7%) provided at least 1 attainable source that could be utilized to check the veracity of at least one claim made in the advertisement. Of all 327 claims made, 45.0% provided an initially attainable source, and 49.9% of claims were matched with a source that was either initially attainable or was obtained upon request from a sponsoring pharmaceutical company. See Figure 1 for a depiction of how advertisements and claims were gathered and coded.

Support for Claims

Of the 38 advertisements for which we obtained at least 1 source cited by an advertising claim, 27 (71.1%) contained at least 1 claim that we could not substantiate. A total of 163 claims were made for which some sort of cited reference material was obtained, of which 65.0% were substantiated by the cited source. As can be seen in Table 1, frequency of

TABLE 1. Support of Claims in Advertisements for Which a Cited Source Was Obtained

Type of Claim	No. Claims	Percent Supported	95% CI
Efficacy	94	53.2	46.2–60.2
Safety	38	84.2	72.9–95.5
Disorder	12	75.0	49.7–100.0
Mechanism	8	62.5	25.5–99.6
Popularity	5	100.0	NA
Convenience	4	75.0	0–100
Other	2	100.0	NA
Total	163	65.0	61.0–69.1

NA indicates not applicable.

support varied by claim type, with efficacy claims being the least likely to be supported by their cited sources.

When peer-reviewed sources were cited, they supported the referencing claims 73% of the time. Table 2 describes the extent to which support varied by the type of claim. Efficacy claims were the least likely to receive support from their cited peer-reviewed sources.

There were various reasons why claims were not supported by their sources. In some instances, the claim was clearly contradicted by the cited source, whereas in others, the cited source did not provide data that was directly relevant to the claim. Table 3 provides a representative sample of reasons why claims were not supported.

Data on File

Of requests mailed to 9 companies regarding claims made in 29 advertisements, we received replies from 3 companies, one of which provided a summary of results from various studies, one of which provided 3 journal article reprints, and one of which provided a letter denying information on the basis that it was against company policy to

provide such data. Of claims citing the attained data on file, only 4 of 16 were supported (25%; 95% CI 13.1–36.9).

DISCUSSION

Our results indicate that claims made in medical journal advertisements for psychiatric medications are frequently not supported by their cited sources and that claims are often linked with sources which are unattainable. Over a third of claims for which we attained sources were not supported by their cited sources, while nearly one half of claims regarding a product's efficacy were not supported by cited sources. In addition, over half of claims either cited an unattainable source or provided no source at all. Our findings suggest that medical journal advertisements for psychiatric medications are frequently misleading and often fail to provide attainable sources that can be used to check the veracity of their advertising claims.

It might be thought that advertisements that cite peer-reviewed sources would be quite likely to cite their sources accurately, yet we found that advertisements citing peer-reviewed sources were frequently misleading. Thus, the quality of the cited source does not necessarily relate to a greater degree of accuracy in advertising.

Every relevant study with which we are familiar has found that drug advertisements in medical journals are frequently not supported by their cited sources and frequently fail to provide sources to substantiate their claims; further, data on file are frequently not provided when requested (Bhattacharyya et al., 2003; Cooper and Schriger, 2005; Greving et al., 2007; Lankinen et al., 2004; Loke et al., 2002; Mindell and Kemp, 1997; Smart and Williams, 1997; van Winkelen et al., 2006; Villanueva et al., 2003). Studies examining the accuracy of advertising claims have used varying criteria when evaluating claims for accuracy, yet all have found that a sizable percentage of advertisements, regardless of the type of medication advertised or the

TABLE 2. Support of Claims in Advertisements for Which a Cited Peer-Reviewed Source Was Obtained

Type of Claim	No. Claims	Percent Supported	95% CI
Efficacy	62	67.7	59.9–75.6
Safety	9	77.8	43.9–100.0
Disorder	11	81.8	59.2–100.0
Mechanism	2	100.0	NA
Popularity	3	100.0	NA
Convenience	0	NA	NA
Other	2	100.0	NA
Total	89	73.0	66.9–79.2

NA indicates not applicable.

TABLE 3. Samples of Unsupported Claims

Claim	Type	Product	Reason Why Claim Was Not Supported
Low weight gain with monotherapy	Safety	Risperidone	Weight gain on drug was 1.6 kg compared with a mean weight loss of .25 kg on placebo over a 3-wk trial ($p < 0.0001$).
Therapy with Namenda + donepezil resulted in sustained cognitive performance above baseline for 6 mo compared with the progressive decline seen with donepezil + placebo treatment	Efficacy	Memantine	Cognition scores increased in both groups for 8 wk before scores began to decline in the donepezil plus placebo group, which is not reflective of progressive decline across the course of the investigation.
In patients who have been discharged up to 25% are not fully compliant with their antipsychotic medication within 7–10 d	Disorder	Risperidone	This claim implies problematic compliance across various medications, yet the study shows that 25% of patients were not compliant with risperidone, while all patients were compliant with olanzapine, another medication used in the study.
Benefits were seen across scale parameters, including attention, praxis, visuospatial ability, construction, and memory	Efficacy	Memantine	Although efficacy was exhibited on some measures, the noted parameters were not reported in the cited source.
Significant improvement in symptoms of mixed episodes	Efficacy	Ziprasidone	The studied group included individuals in the midst of a current mixed or manic episode. Ziprasidone was superior to placebo when the manic and mixed groups were pooled, but no analysis was reported by manic or mixed subgroup.

country in which the advertising has appeared, contained misleading statements.

Limitations

Our study had several limitations. Any flaws in our coding scheme for determining whether claims were supported by their cited source could have skewed our results. Our coding scheme was simple and reasonably well defined, which likely accounted for our high interrater reliability. However, our coding scheme was quite lenient. Regarding nonspecific efficacy claims (e.g., “improves cognition”), we only required that a drug show superiority to a placebo or comparison drug on 1 relevant measure, even if multiple measures were used. Thus, some claims that were labeled as supported may have not been particularly well substantiated, as efficacy was sometimes found on only 1 or 2 of multiple measures used in a cited clinical trials. In addition, we did not consider various confounding or data reporting variables that potentially existed in the cited references we obtained. For example, we did not assess the validity of outcome measures, the clinical significance of improvement on dependent measures, the degree to which breaking the study blind may have influenced the study’s results (e.g., Fisher and Greenberg, 1993), or numerous other study design features that could have limited the degree to which a claim was empirically substantiated by a cited source.

In addition, when coding generic safety claims, it was difficult to devise a rigorous coding scheme, as there are few clear standards regarding safety. It is not clear how to best evaluate an advertising claim that a drug is safe, as the definition of safety is likely quite different across various health professionals. Additionally, our coding of accuracy in mechanism of action, disorder, popularity, convenience, and “other” claims was lenient in that while the cited source must have supported the claim in general, we did not examine the strength of the evidence in the cited sources. Another potential limitation is that we only checked cited sources; we did not assess claims that did not cite sources and we did not search for potentially conflicting evidence that was not cited in advertisements. As companies are free to choose the citations which appear in their advertisements, it seems likely that they would selectively cite sources that tend to support their claims as opposed to sources that provide data contrary to their advertising claims. A coding scheme that required more rigorous support to label claims as supported would likely have yielded a lower rate of supported claims.

It is quite important to note that claims which were not supported by their cited sources were not necessarily false. Although some claims were demonstrably false, others cited studies that likely contained relevant information but presented it in a manner that did not allow us to code the claim for accuracy. Some claims cited specific subscales purportedly used in a study, yet the scales were not mentioned in the cited study, whereas other efficacy claims were made regarding a patient subgroup but the referenced study did not provide a relevant analysis by patient subgroup. Thus, it is unclear to what extent such claims were supported. However, we believe that the burden of proof lies in the hands of the

advertiser, and that if a source is cited, it should clearly support the advertising claim.

It is possible that our sample was not representative of psychiatric medication advertisements, as we only selected 4 journals. However, there was substantial overlap between the journals in the psychiatric medication advertisements that were displayed in 2005. In addition, advertising is expensive to produce, so we doubt that there was a substantial set of psychiatric drug advertisements that appeared in other medical journals but not in the journals we selected for review.

Implications

On one hand, journal advertising is often misleading, and on the other hand, journal advertising appears to influence prescribing behavior (http://www.rxpromoroi.org/rapp/exec_sum.html, undated; Hunt, 2005; Wittink, 2002). Taken together, these findings are disturbing and suggest that misleading advertising may exert an adverse impact on prescribing practices. In the present study, efficacy findings were not supported in nearly half of the claims, suggesting that providers might be exposed to unrealistically positive claims of drug efficacy in drug advertisements, though efficacy claims were not the only claims unsubstantiated by their sources.

In line with prior research (Cooper and Schriger, 2005), we found that obtaining data on file cited in advertisements is difficult. Indeed, Wyeth responded to our request with a letter stating, in part, “unfortunately, our internal policies do not allow for distribution of unpublished data (a copy of this letter is available from the corresponding author),” which seems quite ironic given that a 2004 journal advertising campaign by Wyeth for its antidepressant venlafaxine stated, in part “see depression, see the data, see a difference.” Obviously, a failure to provide requested data leaves health care professionals in the rather precarious position of merely having to trust that the cited data on file is accurate, yet research has consistently found that claims made in advertising are inaccurate, and our study found that data on file often failed to support advertising claims that linked to such data. Our findings regarding the poor accuracy of claims linked to data on file are similar to findings from another investigation (Bhattacharyya et al., 2003).

It has been suggested that journals improve their review policy of advertisements (e.g., Wilkes et al., 1992), as it is obvious that many of the advertisements are of low scientific quality and are misleading. We concur that review policies need to be strengthened significantly. Physicians are frequently encouraged to closely examine evidence contained in peer reviewed journals. It is striking that advertisements that are often quite poorly based on evidence sit alongside peer-reviewed research that is considered the foundation of evidence based medicine! Although medical media trade magazines feature an advertisement suggesting that drug representatives should be armed with journal advertising to aid in their detailing visits (Arnold, 2007), it seems that physicians should also be well armed with a healthy dose of skepticism when perusing such advertising.

The FDA has the authority to require advertisers to correct misleading or false advertisements which appear in medical journals. Some offending advertisements can be seen

on an FDA website (Food and Drug Administration, 2007). However, FDA does not require companies to submit promotional pieces for review until they are published. The FDA unit charged with reviewing drug advertising (Division of Drug Marketing, Advertising and Communication; DDMAC) has 21 staff, including team leaders, who review advertising that is primarily or exclusively intended for health care professionals. These reviewers were in charge of reviewing a total of at least 39,153 drug promotional pieces submitted in 2005 (these numbers are based on data presented in 2006 by Melissa Moncavage, a staff member at DDMAC, that was forwarded by Crystal Rice, a staff member at the FDA department of Trade Media and Exhibits. These data are available from the corresponding author). An additional 6223 ads were labeled as “mixed,” and were targeted to both health care professionals and consumers. Of these mixed advertisements, those primarily targeted to health care professionals were reviewed by the review groups previously mentioned, whereas advertisements targeted primarily toward consumers were reviewed by separate direct-to-consumer review groups (based on a personal communication with Crystal Rice; available upon request from the corresponding author). It is unclear what percentage of the mixed advertisements was reviewed by the direct to consumer groups versus the professional review groups. In any case, such a high workload virtually guarantees that a high percentage of advertisements are unlikely to be reviewed thoroughly.

Given that both the FDA and medical journals seem unable to regulate journal advertisements effectively under the current systems of evaluation, 1 possible solution is to change medical journal advertising policies, as most journals allow only advertisements for drugs and medical devices. Providing advertising space to a very limited set of advertisers likely restricts the extent to which journals will regulate claims made in advertising (Fugh-Berman et al., 2006; Orentlicher and Hehir, 1999). It seems unlikely that journal business managers would be willing to risk offending a sponsor whose advertisement is misleading, as pulling advertising can lead to a substantial loss in revenue. However, if a wider variety of advertising was allowed, such as for automobiles, jewelry, vacation packages, and other likely upscale products, journals could be more exacting in their standards for drug ads. If a drug advertisement were pulled due to its misleading claims, it could be relatively easily replaced by an advertisement from another sponsor, given the much wider pool of sponsors such a new policy would likely attract. Indeed, even if a sponsor chose to boycott advertising in a journal to protest a decision regarding an advertisement, it seems likely that the numerous sponsors would fill the void, as the readership of medical journals generally consists of an affluent audience in possession of a high disposable income.

Other options that have been suggested to replace drug advertising revenue include charging authors publication fees as well as seeking support from foundations and institutional members (Fugh-Berman et al., 2006). There are numerous potential solutions to the problem of misleading drug advertisements in medical journals and the results from the present

study, in combination with results of similar investigations, suggest that efforts at reform should begin in short order.

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