What do medical students think about pharmaceutical promotion?

David Carmody
Sixth Year Medicine/Arts (Undergraduate)
University of Melbourne

David is an active member of the student group 'Pharma Phacts' which aims to educate medical students about the effects of pharmaceutical promotion.

Dr. Peter R. Mansfield
General Practitioner
Visiting Research Fellow, General Practice,
University of Adelaide

Peter is a General Practitioner in Willunga, South Australia and the Founder and current director of 'Healthy Skepticism Inc.', an international non-profit group aiming to improve health by reducing harm from misleading health information.

Aim: The aim of this review was to produce an overview of surveys of medical students' exposure to and attitudes towards pharmaceutical promotion. **Methods:** PubMed was searched for studies featuring surveys of medical students regarding their interactions with pharmaceutical promotion and tabulated the findings for survey questions relating to the main themes. **Results:** Students have significant exposure to promotion, and they generally view receiving gifts as acceptable, but do regard some gifts as more appropriate than others. Most students think pharmaceutical sales representative (PSR) presentations are biased but still of educational value and should not be banned. Most students do not believe promotion will affect their prescribing behaviours. A large majority of students want more education in their curricula on how to interact with PSRs. **Conclusions:** Many medical students think that pharmaceutical promotion is biased and feel underprepared for interactions with the pharmaceutical industry. Despite this, they accept exposure to pharmaceutical promotion believing that it will not influence them. There is scope for improved education in medical schools about this issue.

Introduction

Pharmaceutical promotion in its many forms is a ubiquitous feature of modern medicine. From pens and mugs through to sponsored educational events and conferences, it is estimated each doctor in Australia is exposed to $21,000 worth of pharmaceutical company promotion every year. [1] The scale of pharmaceutical promotion is obvious and its effects on doctors, such as increased non-rational prescribing, increased costs and preferences for newer drugs over older or generic drugs, are well documented. [2,3] Considerably less is known about the interactions between the pharmaceutical industry and medical students. This review will summarise the studies currently available that investigate the exposure of medical students to pharmaceutical promotion and their attitudes towards it.

Criticisms of pharmaceutical promotion are largely focused on its effects on doctors' prescribing behaviour. Since students rarely have a role in prescribing, it may seem that their exposure to promotion should be less of a cause for concern. They are also less likely to discriminate between pharmaceutical companies and it has been demonstrated in one study that most students did not know which company had been responsible for gifts they had received. [4] However, whilst students cannot prescribe and may not draw direct connections between gifts and their source, the behaviour of accepting gifts and the perception of this as acceptable practice may influence their long-term behaviours as doctors. [5] Therefore, any attempts to limit the negative effects of pharmaceutical promotion on doctors must also consider the attitudes and behaviours of medical students. Consequently, this review provides an overview of what is known from surveys about medical students' attitudes and behaviours towards pharmaceutical promotions.

Methods

To find studies that dealt with the issue of medical students attitudes to pharmaceutical promotion, we searched PubMed for English-language papers with the following terms, "attitudes OR survey AND medical students AND (pharmaceutical OR drug) AND (marketing OR advertising)". We did not use "promotion' as a search term because the PubMed definition of advertising includes not only written advertising but also spoken promotion. The main inclusion criterion was that the study featured a survey of medical students on pharmaceutical promotion. Studies were excluded if they did not feature a survey of medical students or could not be accessed in their entirety. The method of analysis was to select main themes that covered most of the survey questions relevant to students' exposure or attitudes to pharmaceutical promotion. An analysis of answers to questions that related to those main themes was tabulated.

Results

The initial search returned 31 papers, of which 17 were excluded as they did not feature a survey of medical students. Another two were excluded as they did not provide enough information about the students' answers or the questions were not relevant to the main themes selected for this review. [6,7] A further three papers were included following a search of the included papers' bibliographies. One study was unable to be accessed in its entirety and was thus excluded. [8] This left fourteen papers in total.

The main themes selected were:

- exposure to forms of promotion;
- perceived appropriateness of gifts;
- bias and perceived value of pharmaceutical promotion;
- whether pharmaceutical promotion should be banned;
- the effects of promotion on prescribing; and,
- education that students receive on the issue.

Key themes addressed in the literature

1. Exposure

Ten of the included studies included questions in the surveys aimed to establish the levels and types of exposure that medical students have to pharmaceutical promotion. All of these studies were performed in North America. All 10 studies found that the majority of medical students questioned had had some exposure to a wide range of pharmaceutical promotion. This included indirect exposure through observations of interactions between physicians and pharmaceutical sales representatives (PSRs) and direct exposure, commonly in the form of personal interactions with PSRs, receiving gifts and attending sponsored events (Table 1).

Table 1. *Levels of exposure to forms of pharmaceutical promotion.*

Form of promotion	Percentage offered and/or accepted (%), by study
Non-educational gift	80 [10]; 91.6 [11]; 94.1 [9]; 95 [12]
Meal (unspecified)- Lunch - Dinner	98.1 [11]; 96.8 [9]; 50.6 [9]; 35 [12]
Book (pocket text or text)	51.0 [9]; 68 [12]; 78.5 [11]
Medical tool (stethoscope etc.)	31 [12]
Frequency of gifts	4.1 / month [9]; 5.5 / year [14]
PSR interactions	80% >1 [10]; 10.6 per month [13]1.2 / year [14]
PSR presentations (at least twice per month)	68 [16]; 17 [17]

Sierles *et al.* [9] found that students in five US medical schools reported an average of 4.1 exposures to any type of pharmaceutical promotion per month. Bellin *et al.* [11] found that 71.7% of clinical students surveyed at the University of Minnesota estimated they had had more than 20 exposures to some form of pharmaceutical promotion. The proportion of clinical students that reported receiving at least one non-educational gift, such as pens or mugs, ranged from 80-95%. [9-12] Students reported varied rates of exposure to PSRs. Fitz *et al.* [10] report that 80% of clinical students had at least one exposure to PSRs over the course of their education at four US medical schools, while students at the Creighton University reported high frequencies of interaction with a mean of 10.6 per month. [13] Canadian psychiatry clerks report attending a mean of 12.2 lunches per year and accepting 5.5 promotional items per year. [14]

Those studies that sampled and differentiated between clinical and pre-clinical medical students found that the percentage of students exposed to promotion and the frequency of accepting it increase with progression through the medical course. [10,11]

2. Appropriateness of gifts

In most surveys, the majority of students indicated they believed that it was acceptable for medical students and physicians to receive gifts from pharmaceutical companies. Sierles *et al.* [9] found that 80.3% of students thought it was, "sometimes okay to accept gifts and lunches because students have considerable debts and minimal income". Fitz *et al.* [10] reported that 65% of clinical students thought that accepting gifts was appropriate and Barfett *et al.* [18] report that 23% of students at a Canadian medical school agreed with the statement that it was unacceptable for physicians to receive gifts. However, in contrast to these surveys, Hyman *et al.* [21] found that only 26% of students at Harvard Medical School considered that accepting gifts was appropriate.

Many students make distinctions as to the level of appropriateness of different gifts (Figure 1). Meals are seen as the most acceptable types of gifts from pharmaceutical companies, with 77.4% of students believing they are appropriate. [9] Students also approve of textbooks as gifts

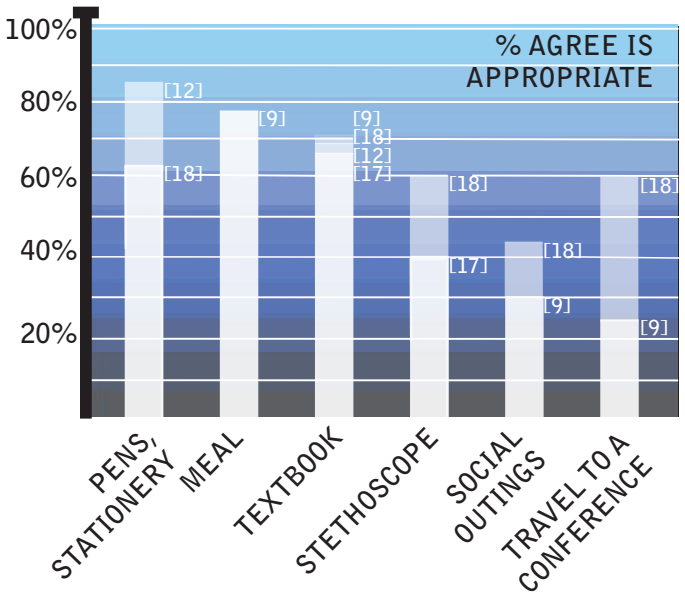

Figure 1. *Student's perceptions of appropriateness of gifts from pharmaceutical companies.*

with 65-71.5 % considering them appropriate. [9,18,19] Stationery (62 % [19] or 4.1 on a 5-point Likert appropriateness scale [13]) and stethoscopes (44-60 % [18, 19]) are also widely accepted, while social outings, drug samples, vacations and funding for travel to conferences tend to be viewed as appropriate by a minority of students. [9,19]

3. Reliability and usefulness of pharmaceutical promotion

Sierles *et al.* [9] found that 67.4 % of students thought grand rounds sponsored by drug companies were biased in favour of the company's product. Monaghan *et al.* [13] asked this question in a slightly different way and found that students gave PSR presentations a mean rating of 2.5 out of 5 for accuracy. Despite this general recognition of bias, many students still value drug company-funded educational sources. [13,14,16,20] Sierles *et al.* [9] found 89% of students thought drug sponsored grand rounds were helpful and educational and 71.3% considered drug company materials a useful way to learn about drugs. Other studies reported smaller proportions of students that shared this view on the value of sponsored events, with 32-46 % agreeing that they had educational value, [14,19] and 22.1% seeing PSR interactions as useful. [20] Outside North America, Ball and Al-Manea [19] found that 60% of students in Kuwait thought promotion was biased and prior to changes in legislation that reduced contact with pharmaceutical promotion, 49% and 45% of Finnish students rated PSR interactions and drug sponsored educational events respectively in their top three most useful sources of information. [16]

4. Whether PSRs should be banned

When asked whether contact with the drug industry whilst in medical school should be limited by banning student interactions with PSRs, most students rejected this proposed action, with 59-82.7% of students in three surveys disagreeing [9,14,18] and a Likert scale rating of 1.6

Table 2. *Perceived effect on prescribing behaviour.*
**Scale from 1 to 5: 1 = strongly disagree, 5 = strongly agree .*

Proposition	Percentage agree (%), by study	Likert scale*
Gifts will have no impact on: 1) my future prescribing 2) my colleagues' prescribing 3) physicians' (in general) prescribing	56 [14]; 68.8 [9]; 57.7 [9]; 72 [10]; 75 [12]	2.8 [13]
Interactions with PSRs will have no impact on my future prescribing	34 [14]	-

(where 1 = strongly disagree) in one medical school. [13]

5. Influence on prescribing

It appears that many medical students feel invulnerable to being influenced by pharmaceutical promotion (Table 2). Of students surveyed, 56-68.8 % believe their own prescribing practices will not be affected by accepting gifts [9,14] and 72-75% of students disagreed when asked more generally if physicians would be affected. [10,12] Sierles *et al.* [9] also demonstrated that students believe that they will be less affected than their peers.

6. Education on this issue

A majority of medical students do not feel adequately prepared by their medical courses on how to interact with PSRs and would like to have more teaching on this included in the course. 61-82.9 % of students felt their medical course did not provide sufficient training [9,21] and 52-77.8 % of students said they would have liked more teaching. [9,16,17] One study found that most students have not even discussed the issue with advisors or instructors. [11]

Discussion

This review has found that studies of medical students' beliefs about pharmaceutical promotion have investigated six main topics: exposure, gifts, perceived reliability and usefulness, whether PSRs should be banned, influence on prescribing and level of education on this issue. Most students had been exposed to pharmaceutical promotion. They tended to believe promotion is often biased and education on the issue is inadequate. Most believed that gifts were acceptable and representatives should not be banned presumably because they believed that promotion was useful.

The widespread belief amongst students that pharmaceutical promotion is often biased is supported by evidence. [22,23] By contrast, student's feelings of invulnerability are contrary to the available evidence that pharmaceutical promotion does influence prescribing. [1-3,5] In addition, students seem to believe that the effects of pharmaceutical advertising will be more pronounced in their colleagues than themselves. This sense of unique invulnerability has been documented previously amongst doctors [3] and may suggest a naïve and inflated sense of objectivity in prescribing, as well as a curious differentiation between their abilities and those of their colleagues.

While students claim pharmaceutical promotion has little effect on prescribing behaviour, they still differentiate levels of appropriateness of gifts, suggesting they do in fact attach some negative value to gifts they view as more expensive, unnecessary or influential (Figure 1). This implies they are at least aware of the negative effects of external influence on their prescribing but assume a "dose-response" relationship between the value of a gift and its potential influence. However, there is evidence to suggest that even small gifts may still have an effect on behaviour. [24] It may also make students more vulnerable to the effects of low value gifts if they do not perceive them to be threats to objectivity or worthy of vigilance. The fact that they see some potential negative effects, even if only from expensive gifts, also suggests that there may be scope for major changes in attitude if they are presented with convincing evidence that pharmaceutical promotion can be effective in misleading them. [12, 25-27]

This review is the first to examine the opinions and attitudes of medical students specifically. Wazana [2] reviewed studies of doctors at all stages whereas Zipkin *et al.* [3] focused on trainees. Their results are similar to ours especially for senior students.

Whilst only intended as a review of the literature available on the topic of students and pharmaceutical promotion, this review nevertheless has certain limitations. The studies that were chosen were only those that were available in English via PubMed, therefore some studies may have been missed. This review is systemic, but is not a quantitative meta-analysis, therefore subjective bias may influence the selection and presentation of information.

All of the studies included in this review had limitations. They used multiple-choice questions or Likert-style questions which may elicit answers that are not indicative of behaviours or attitudes in situ. Students' answers could have been biased by (for example) an inclination to reflect what they believed to be more socially desirable. However, this style of investigation is appropriate to satisfy the aims of each study. [28]

The response rates (when provided) in the reviewed studies ranged from 20-100%, reflecting researchers failure at times to maximise participation by using strategies such as those detailed by Boynton. [28] Particularly in voluntary surveys about ethical issues such as this, studies may crucially overlook those students who choose not to participate. This may be because they have dismissed the issue as unimportant or are apathetic towards it, or indeed are apathetic toward voluntary surveys, thereby potentially skewing the results towards the opinions of those students who have stronger feelings about the issue and hence, participate in the survey.

Selection bias may have occurred in many of the studies. The medical schools chosen may introduce selection bias, as certain schools or locations may imbue students with certain attitudes that are specific to that school, reducing the ability to generalise the results to medical students as a single group. Only five of the studies [9,10,16,17,25] compared responses across different schools with the same instrument, and even then, Sierles *et al.* [9] admit that for their study, schools were chosen non-randomly in an attempt to access a broad sample. In terms of international comparisons, studies undertaken in different countries used different methods, in particular different questions, so the available data is not adequate to determine if there are differences over time or from place to place. If there are such differences further study would be needed to determine if the differences arose from variations in levels or types of pharmaceutical promotion targeting students, as well as students' attitudes or institutional policies.

The implications of this review are chiefly that medical educators should be aware that medical students are exposed to pharmaceutical promotion and, currently, feel underprepared for their present and future interactions with the pharmaceutical industry. Students also tend to have beliefs that appear contradictory to available evidence. This suggests a need to improve medical courses.

To date, there has not been any published research into Australian medical students' attitudes on pharmaceutical promotion. Medical educators in Australian universities would therefore benefit from more information specific to Australian students. Based on this review of previous studies, a study design that would be useful in providing this information should involve a large sample of clinical medical students from multiple universities and a questionnaire that has been validated in previous studies and piloted on a representative sample of Australian medical students. We suggest that the survey used by Sierles *et al.* [9] would be most appropriate and would allow for international comparison.

Conclusions

From this review of the available literature on the issue of medical students' exposure to and attitudes towards pharmaceutical promotion, it is possible to draw the following conclusions. Students have considerable exposure to promotion, and they generally view receiving gifts as acceptable, but do regard some gifts as more appropriate than others. They tend to think PSR presentations are biased but still of educational value and should not be banned. Most students do not believe promotion will affect their prescribing behaviours. A large majority of students want more education in their curricula on how to interact with PSRs.

The issue of pharmaceutical promotion and students should be of concern to Australian medical students and educators, as the evidence from overseas studies suggests students face considerable levels of pharmaceutical promotion without formal instruction on how to best

approach it. It is important to note that none of the papers in this review were based in Australia, so more research in Australian medical schools would be beneficial in order to direct interventions.

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Conflict of interest

None declared.

Correspondence

D Carmody: dave_carmody@hotmail.com

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