

Pre-Clinical Medical Students' Exposure to and Attitudes Toward Pharmaceutical Industry Marketing

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Abstract

Background - Recent studies have examined the exposures and attitudes of physicians and third- and fourth-year medical students toward pharmaceutical industry marketing, but fewer studies have addressed these topics among pre-clinical medical students. Thus, the purpose of this study was to assess pre-clinical students' level of exposure to the pharmaceutical industry and their attitudes toward marketing.

Method - First and second-year medical students at UCLA completed a 40-item survey based on previous studies.

Results - Over three quarters of pre-clinical students (78.5% or 226 of 288) responded to the survey. Exposure to pharmaceutical industry marketing started very early in medical school. Most second-year students (77%) had received gifts including drug samples after three semesters. Most felt that this would not affect their future prescribing behavior.

Conclusions - These findings and findings from related studies, coupled with the students' desire to learn more about the issue, suggest that an early educational intervention addressing this topic may be warranted in American medical schools.

American physicians are regularly exposed to vast amounts of pharmaceutical industry marketing, such as drug samples, meals for office staff, glossy brochures, and meetings with pharmaceutical industry representatives, or "drug reps." Campbell et al. recently reported in the *New England Journal of Medicine* that the average general internist in their study met with a drug rep 10 times per month.¹ Other studies have exposed potentially negative consequences associated with interactions between the pharmaceutical industry and physicians, including a negative influence on physicians' prescribing patterns,^{2,3,4,5} the practice of non-evidence-based medicine,⁶ and an adverse effect on the public's perception of physicians.⁷ These interactions extend into the wards with fellows, residents, interns, and clinical undergraduates.⁸

Evidence also suggests that direct exposure to pharmaceutical industry marketing lessens medical students' skepticism toward the industry^{2,3} and that such exposure may be occurring during the first two years of medical school.⁹ However, to date, only a few studies have

quantified pre-clinical students' level of exposure to such marketing and their attitudes toward these marketing efforts.^{10,11} Bellin et al. studied exposures and attitudes of both pre-clinical and clinical medical students at the University of Minnesota, Twin Cities, during the 2001-2 school year, with a 69.1% response rate. However, they did not include first-year medical students, nor did they assess whether or not pre-clinical students trusted drug-company-sponsored materials as an appropriate source of medical information.¹⁰

Another survey conducted by Hyman et al. of pre-clinical and clinical Harvard medical students in 2003-4 reported an overall response rate of 58%, but they did not include the specific response rate of pre-clinical students. Hyman et al. also did not examine the amount of exposure to pharmaceutical industry marketing that the Harvard students had experienced.¹¹

Moreover, neither of these studies asked students if they felt that they or their peers would be influenced by

free gifts or food from pharmaceutical companies. Thus, the purposes of this study were the following:

1. To examine the extent to which pre-clinical students are exposed to pharmaceutical industry marketing, and
2. To determine pre-clinical students' attitudes toward the pharmaceutical industry's interactions with medical professionals.

Method

We obtained approval from the University of California Los Angeles (UCLA) Institutional Review Board to survey first- and second-year students at the David Geffen School of Medicine at UCLA (classes of 2009 and 2010). All first- and second-year students (n=288) were invited via e-mail to participate in our anonymous online survey between October and December of 2006 during the first semester of the year for both classes. Secure, web-based evaluation software (CoursEval, version 3.0, Academic Management Systems, Buffalo, New York) was used, and only those students who were invited to participate had access to the survey.

The 40-item questionnaire contained elements from two previous surveys^{8,12} that asked questions similar to the ones below. However, because the previous surveys were geared toward clinical students, several items were modified slightly to suit pre-clinical students better. Five questions assessed students' exposure to the pharmaceutical industry, and two more asked students to estimate how often they had discussed marketing by the pharmaceutical industry with their peers. (See Table 1. One of the five exposure questions was not reported here because we felt it was a poorly worded question.)

Another set of eleven questions asked for students' opinions about marketing by the pharmaceutical industry. For Table 1: Student responses to items related to exposure furthermore, an eight-item Likert-scaled question set (very appropriate to very inappropriate) asked about the appropriateness of certain gifts from drug representatives. The results for most of these questions are presented in Figure 1 (See appendix).

Remaining questions pertaining to students' demographic information are not presented here due to lack of relevance. We used the questions from the last 2 questions from Table 1 and Figure 1 as a proxy for pre-clinical students' attitudes toward the pharmaceutical industry's interactions with medical professionals.

Data were analyzed with SPSS, version 15.0 (SPSS Inc. Chicago, Ill).

Results

Of the 288 students invited to participate in this survey, 226 (78.5%) responded. The response rate for first-year students (MS1s) was 71.2% (104/146) and for second-year students (MS2s) 85.9% (122/142). The ages of participants ranged from 19-32, with a mean of 24.22 years and a standard deviation of 2.08 years. Our study population included 104 (46%) male and 122 (54%) female respondents.

Table 1 displays student exposure to certain forms of pharmaceutical industry marketing. Of note, by the end of the first semester of their second year of medical school, 56.8% of MS2s had received a small non-educational gift from a pharmaceutical company, 52.9% had received free food from a drug representative, and 46.4% had received pharmaceutical industry-sponsored brochures. Most alarmingly, 11.1% of second-year students

reported receiving drug samples, including 4.3% who reported receiving five or more samples. Numbers in all of these categories were significantly lower for the first-year students, but not 0%. Hence, exposures to pharmaceutical marketing efforts that physicians face commonly are already well underway during the pre-clinical years of medical school at UCLA.

Since beginning medical school, approximately how many times have you:	Student Year	% of students exposed classified by number of exposures		
		0	1 - 4	5 or Greater
1. Received a small non-educational gift (e.g., pen, coffee mug) from a drug company rep	1 st Year	82.4	17.6	0.0
	2 nd Year	43.2	39.8	16.9
2. Eaten a snack(e.g., donut, candy, coffee) provided by a drug rep	1 st Year	88.9	11.1	0.0
	2 nd Year	47.1	42.3	10.6
3. Received a journal reprint or glossy brochure from a drug company rep	1 st Year	96.1	3.9	0.0
	2 nd Year	53.6	38.4	8.0
4. Received a drug sample from a drug company rep	1 st Year	99.0	1.0	0.0
	2 nd Year	88.9	6.8	4.3
5. Discussed the possible influence of drug company sponsorship after a drug company-sponsored presentation	1 st Year	81.4	17.6	1.0
	2 nd Year	57.5	30.1	12.4
6. Discussed with a friend or fellow medical student, the pros and cons of drug company gifts to MD's	1 st Year	48.0	44.1	7.8
	2 nd Year	20.0	47.5	32.5

Table 1: Student responses to items related to exposure

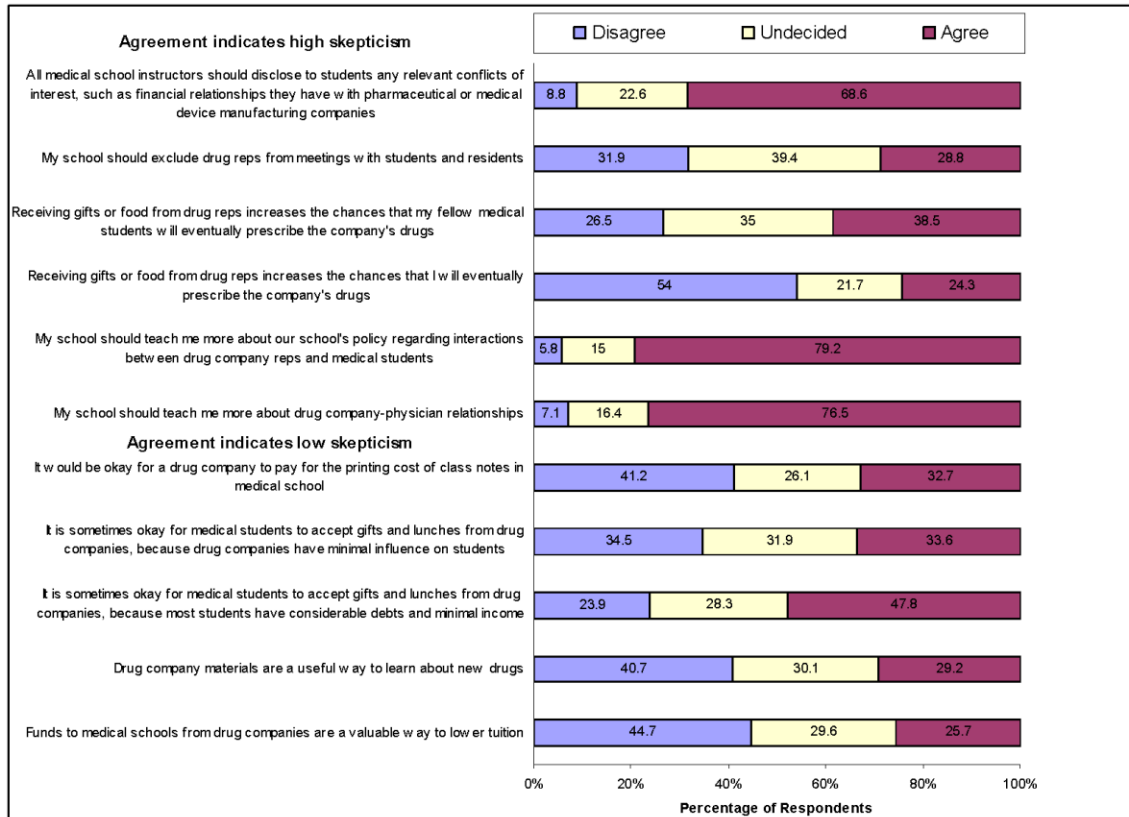


Figure 1: Student responses to items related to skepticism (% in each response category).

Forty-two and one-half percent of the MS2s had already discussed possible pharmaceutical industry bias after a drug-company-sponsored presentation, and 80% had discussed the pros and cons of drug company gifts with their peers. This indicates that most UCLA pre-clinical students are well aware of pharmaceutical industry marketing by the end of the first semester of their second year.

Figure 1 displays students' opinions about receiving gifts and about institutional guidelines. About two-thirds of students (68.6%) felt that all lecturers should disclose relevant conflicts of interest to medical students, but only 28.8% felt that drug representatives should be excluded from meeting with students. A majority of students (54%) thought that receiving gifts would not affect the chance that they would prescribe the company's drug in the future. Interestingly, a markedly smaller group (27%) felt that their peers were equally immune to pharmaceutical marketing influences. Finally, more than three-quarters (79.2%) of students wanted more attention in the curriculum devoted to institutional guidelines regarding interaction with drug representatives, and 76.5% wanted more instruction on drug-company/physician relationships.

On items related to appropriateness of pharmaceutical gifts, about one-third (32.7%) of students thought it would be okay for a drug company to pay the cost of printing notes for them. Also (not included in Figure 1), about half the students felt that a meal, a textbook, or paid travel to a conference were appropriate gifts. About two-thirds of students felt that gifts greater than \$50 in value and paid vacations were inappropriate. Students had mixed opinions about gifts less than \$50, personal drug samples, or social outings. For gifts less than \$50, 39.8% felt it was inappropriate, 24.8% were undecided, and 35.4% felt it was appropriate.

Almost half of the students (48%) thought that receiving gifts from drug companies was justified because of students' personal financial situation. Concerning personal drug samples, 45.1% of students rated them as inappropriate, 23.9% were undecided and 31.0% felt they were appropriate. About four of ten (41.2%) students thought drug representative-sponsored social outings were inappropriate, 28.3% were undecided, and 30.5% felt they were appropriate.

Discussion

This survey, coupled with the two others described above,^{10,11} provides a glimpse of American pre-clinical medical students' exposure to and attitudes toward pharmaceutical industry marketing.

Exposures - By the second semester of their second year, roughly half of UCLA students responding to this survey had been exposed to non-educational gifts, food, and published materials provided by drug representatives, and one out of nine had received at least one free drug sample. Bellin et al. reported that almost all (95%) of second-year medical students at Twin Cities were exposed to some form of pharmaceutical industry marketing.¹⁰ As noted above, Hyman et al did not report on exposures by Harvard medical students.¹¹

Taken together, these data support the notion that even pre-clinical students nationally may already be exposed to significant marketing efforts from the pharmaceutical industry. Our study did not ask students *where* students were exposed, but Bellin et al. mentioned "institutional settings, including school, hospitals, and clinics"¹⁰ as the most common sites of exposure.

Attitudes - About one out of four UCLA pre-clinical students thought that pharmaceutical marketing could affect their future prescribing patterns, but more than one out of three thought that their peers were more vulnerable to these effects, mirroring results with practicing physicians.³ Depending on how the question was asked, about one-third to one-half of them rationalized the appropriateness of drug-industry gifts. About 30% of UCLA pre-clinical students felt that drug company materials were a useful way to learn about new drugs.

The study of Twin Cities students did not specifically answer these types of questions but noted that their students rated pharmaceutical marketing exposures slightly positively (average score 2.67 where 1 = most positive and 5 = most negative).¹⁰ About half the students in the Harvard study felt it appropriate to accept gifts from drug companies, and about one quarter felt that drug company materials were a useful way to learn about new drugs. However, the Harvard study did not address other issues relating to exposure noted above.¹¹

These three studies demonstrate that many American medical students may have positive attitudes toward pharmaceutical marketing efforts, which might make them less skeptical of the claims made by pharmaceutical companies. This may affect their prescribing patterns and

their ability to practice evidence-based medicine, just as with current physicians.

Implications for Medical Education - With these data in mind, educational interventions may be warranted during the pre-clinical years. About three quarters of UCLA pre-clinical students and almost two thirds of Harvard medical students¹¹ wanted more instruction relating to the pharmaceutical industry and school policy toward interaction with the industry. This question was not addressed in Bellin et al.¹⁰ This "captive audience" might benefit from well-designed curricular interventions addressing this interest. While some educators argue that these interventions may not be necessary so early in medical school, early exposure to pharmaceutical industry marketing and students' somewhat favorable attitudes towards it suggest that educators should intervene early. An early intervention may catch physicians in training while they are most flexible in their attitudes towards pharmaceutical industry marketing.

Additionally, while our study suggests the value of early intervention, it cannot predict an ideal intervention. One possibility was presented by Wilkes and Hoffman¹³ in which pharmacists pretended to be drug representatives. As drug representatives, they created a promotional marketing pitch to generate critical thinking among third-year medical students regarding pharmaceutical industry marketing.¹³ After this intervention, students expressed more skepticism toward the value of information offered by drug representatives, as noted above. It is unknown if such an intervention could induce similar changes in pre-clinical students, or if it is practical to implement such an intervention nationally, as the cost and necessity of specialized personnel may be prohibitive.¹³

In another study by Wofford and Ohl,¹⁴ 75 third-year medical students were surveyed before and after a workshop in which two faculty members and a drug representative reviewed typical physician-drug representative interactions, the use of samples and gifts, the validity and legal boundaries of drug representative information, and associated ethical issues. However, after the intervention, student skepticism toward the pharmaceutical industry decreased significantly,¹⁴ which is unfortunate given that pharmaceutical marketing efforts are associated with negative effects on patient care as noted in the Introduction.

Future Directions and Additional Study Weaknesses - Therefore, other feasible interventions merit further study. Medical schools such as Stanford and Yale have passed rigorous guidelines limiting interactions between students and faculty of the school and drug

representatives,¹⁵ and UCLA has just implemented new regulations to this effect. Simply explaining to pre-clinical students why the guidelines exist might help educators impress upon students the value of skepticism toward pharmaceutical marketing claims. Also, making pre-clinical lecturers follow Accreditation Council for Continuing Medical Education (ACCME) guidelines while lecturing to medical students and explaining the rationale of this practice to students might help educators achieve similar skepticism.

Other interventions might include Doctoring sessions addressing this topic, or presenting evidence of bias of pharmaceutical industry marketing during evidence-based medicine courses. Before and after such interventions, educators may want to administer a similar survey to pre-clinical students of exposures to and attitudes toward pharmaceutical industry marketing to see what effect these interventions have.

Apart from other weaknesses of this and related studies noted above, this study relied on self-reported information that may not accurately reflect students' actual exposure. Despite the anonymity of the survey, students may still have provided answers that they felt were socially more desirable.

In summary, even at the pre-clinical stage, most American medical students are probably exposed to direct pharmaceutical industry marketing. Many of these students may not be skeptical of such marketing efforts, despite the fact that ample evidence associates these efforts with changes in prescribing patterns and the practice of non-evidenced based medicine. Educational interventions should be studied targeting pre-clinical medical students to increase their skepticism of pharmaceutical industry marketing.

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