BRIEF REPORTS

Effects of an Educational Intervention on Residents' Knowledge and Attitudes Toward Interactions with Pharmaceutical Representatives

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To assess primary care resident and faculty knowledge and attitudes concerning interactions between physicians and pharmaceutical representatives (PRs) and to measure changes in residents' knowledge and attitudes after an educational intervention, we conducted preintervention and postintervention surveys with a causal-comparative group in a university-based primary care residency program. All primary care internal medicine and internal medicine-pediatrics residents and faculty were given the voluntary survey. In general, residents and faculty demonstrated similar responses for the preintervention survey. Differences between faculty and resident opinions were seen in two areas. Faculty were more likely than residents to believe that PRs sometimes use unethical marketing practices ($p < .05$) and that the amount of contact with PRs in the outpatient clinic is excessive ($p < .01$). The postintervention survey of residents demonstrated significant differences between the control and intervention groups for three attitude scales. After the intervention, residents showed an increased belief that PRs may use unethical marketing practices ($p < .01$), that marketing gifts with no patient benefit may be inappropriate ($p = .05$), and that other physicians' prescribing patterns could be negatively influenced through the acceptance of gifts ($p < .05$). A brief educational intervention can change resident attitudes concerning physician interactions with PRs.

KEY WORDS: **ethics; pharmaceutical representatives; resident education; marketing.**
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Medical educators are struggling to address the ethics of interactions between resident physicians and pharmaceutical representatives (PRs).[1–7] Some have argued that physicians in training should receive instruction on interacting with representatives of the pharmaceutical industry,[8] while others believe that PRs should be banned from residency programs.[5] Residency programs have responded by developing regulatory policies,[6] or educational seminars regarding the activities of PRs,[8] or both. Housestaff in residency programs that regulate access to PRs have been shown to perceive fewer benefits from PR interactions and are less likely to view the acceptance of gifts from PRs as appropriate.[9] Anecdotally, Ferguson reported the positive effects of a residency seminar on interactions between physicians and medical service representatives.[8] Using a sample of medical students, Vinson and colleagues reported that a brief educational intervention resulted in a statistically significant change in attitudes toward pharmaceutical marketing.[10] However, the effect of educational interventions on resident knowledge and attitudes toward PRs has not been objectively measured.

The purpose of this study is to assess primary care resident and faculty knowledge and attitudes concerning interactions between physicians and PRs and to measure changes in resident knowledge and attitudes concerning physician-PR interactions after participation in an educational intervention.

METHODS

A survey was developed to assess faculty and resident knowledge and attitudes toward interactions with PRs. Anonymous, voluntary surveys were distributed to all primary care internal medicine and internal medicine-pediatrics residents ($n = 31$) and faculty ($n = 18$) in a university-based training program. Identical surveys were distributed and completed 3 weeks before and 4 weeks after an educational intervention. At the time of this study, the primary care residency program was in the process of developing a policy regarding PR activities in the residency program. This process was an impetus for the design and implementation of this study.

The study was approved by the Human Investigation Committee of Wayne State University. Participation in the survey was voluntary.

Survey Instrument

The survey instrument was a 27-item closed-ended questionnaire. Five-point rating scales were used for 22

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items that concerned beliefs and attitudes regarding interactions between physicians and PRs. The response categories for these rating scales varied by item. One of the following sets of verbal anchors was used for each question: Strongly agree/Strongly disagree; Completely appropriate ethically/Completely inappropriate ethically; Very likely/Very unlikely; Too much [contact]/Not enough. The remaining five questions used a 2-point (Acceptable/Unacceptable) scale to ascertain knowledge of American Medical Association (AMA) guidelines regarding the appropriateness of accepting marketing gifts.

The questionnaire was designed to gather information on eight dimensions including benefit of PR contact (5 items), potential negative influence for self (2 items), potential negative influence on others (3 items), perception of PR ethics (1 item), perception of amount of PR contact (1 item), appropriateness of marketing gifts with patient benefit (5 items), appropriateness of marketing gifts without patient benefit (5 items), and knowledge of AMA guidelines (5 items). Several questions concerning attitudes and beliefs were modeled after the work of other authors.[1,3,9,11]

Intervention

All residents had two opportunities to participate in a noncompulsory 40-minute lecture-and-discussion program that addressed ethical and marketing issues in pharmaceutical promotion. The information used in the development of the program was gathered from published articles. The first half of the program was a didactic presentation on the ethics associated with receiving marketing gifts,[2,12–14] and the guidelines of the American College of Physicians and the AMA regarding the acceptance of gifts.[15,16] The next component of the program was a group discussion of the question, "Would pharmaceutical companies subsidize marketing methods if they were not rewarding?" To facilitate discussion, a summary of pharmaceutical company marketing expenditures,[17] and a review of the literature concerning PR's influence on physicians and residents,[4,18] were presented.

For the final phase of the program, six brief vignettes of physician-PR interactions were presented to demonstrate types of marketing techniques.[19] Each vignette was followed by audience discussion and facilitator presentation on the type of marketing techniques employed in the vignette. In closing, it was stated that pharmaceutical representatives are capable of influencing physicians, physicians can learn to recognize the methods of influence, and physicians should use a rational approach to prescribing drugs.

Data Analysis

For ease of interpretation, a scale descriptor was formulated for each of the eight dimensions measured on the survey instrument (Tables 1 and 2). The scales were standardized to range from 1 to 5 (knowledge ranged from 0 to 5) to permit comparisons across scales that varied in number of items. Differences between residents and faculty before the intervention were evaluated by multiple Student's t tests, using SPSS for Windows (version 6.1). The effect of the intervention, comparing residents who had and residents who had not attended the intervention, was evaluated by Student's t tests of pretest and posttest difference scores. Significance for all comparisons was assigned at $p \leq .05$. One-tailed probabilities were used when examining the effects of the educational intervention because directional hypotheses had been formulated a priori.

RESULTS

Preintervention Survey

The preintervention survey was completed by 28 (90%) of 31 residents, and 14 (78%) of 18 faculty. Faculty and residents demonstrated similarity in their knowledge and attitudes, showing agreement in six of the eight categories (Table 1). In terms of knowledge, both faculty and residents demonstrated adequate knowledge of the AMA guidelines for the acceptance of gifts from PRs. Significant differences between groups were found for only two

Table 1. Preintervention Attitudes and Knowledge of Faculty and Residents Toward Interactions with Pharmaceutical Representatives*

Attitudes/Knowledge Scale Description	Faculty (n = 14)	Resident (n = 28)	p Value
Contact with PRs is not beneficial	2.14	2.31	.237
Interactions with PRs are likely to influence my prescribing behavior in negative ways	4.25	4.27	.377
Interactions with PRs are likely to influence the prescribing behavior of other physicians in negative ways	3.17	2.95	.936
PRs may use unethical marketing practices	2.29	2.82	.037
I have too much contact with PRs	2.57	3.18	.003
It is ethically appropriate to receive marketing gifts with patient benefit	2.03	2.06	.904
It is ethically appropriate to receive marketing gifts without patient benefit	3.54	3.21	.215
Knowledge of AMA guidelines	4.36	4.11	.308

**Values are mean responses. All scales, except knowledge, have a range of 1 to 5. A value of 1 indicates strong agreement with the scale description; a value of 5 indicates strong disagreement. Knowledge has a range of 0 (low knowledge) to 5 (high knowledge).*

Table 2. Mean Difference Scores (Preintervention Minus Postintervention Survey Results) Comparing Intervention and Nonintervention Resident Groups*

Attitudes/Knowledge Scale Description	Intervention (n = 16)	Nonintervention (n = 5)	p Value†
Contact with PRs is not beneficial	−.02	−.04	.469
Interactions with PRs are likely to influence my prescribing behavior in negative ways	.34	.10	.223
Interactions with PRs are likely to influence the prescribing behavior of other physicians in negative ways	.13	−.40	.046
PRs may use unethical marketing practices	.63	−.20	.007
I have too much contact with PRs	.19	.40	.178
It is ethically appropriate to receive marketing gifts with patient benefit	−.04	.04	.376
It is ethically appropriate to receive marketing gifts without patient benefit	−.37	.24	.050
Knowledge of AMA guidelines	−.13	.20	.265

**For all scales, except knowledge, positive numbers indicate increased agreement with the attitude scale. For the knowledge scale, negative numbers represent increased knowledge of AMA guidelines.*

†*One-tailed probabilities.*

single-item categories: faculty were more likely than residents to agree with the statement that PRs sometimes cross ethical boundaries marketing products (p = .037); and faculty were more likely than residents to view the amount of contact time with PRs in the outpatient clinic as excessive (p = .003).

Postintervention Survey

The postintervention survey was completed by 21 (75%) of the 28 residents who had completed preintervention surveys. Among the 21 residents, 16 (76%) had participated in the intervention. Another 4 program residents participated in the intervention but did not complete both preintervention and postintervention surveys. Faculty did not participate in the intervention and were not included in the analysis.

There were no preintervention differences between residents who attended the intervention and those who did not. However, at postintervention, residents who had participated in the intervention displayed significant differences on three of the eight scales as compared with the nonintervention residents (Table 2). Intervention residents showed an increased belief that PRs may use unethical marketing practices (p = .007); that marketing gifts with no patient benefit may be inappropriate (p = .05); and that other physicians' prescribing patterns can be negatively influenced through the acceptance of gifts (p = .046).

DISCUSSION

This study found general agreement among faculty and residents regarding their knowledge and attitudes toward interactions with PRs. However, there were differences between the two groups about whether PRs sometimes cross ethical boundaries when marketing products. A minority of residents in this survey agreed with this statement. In contrast, a study by Keim and colleagues found that 75% of emergency department residents (n = 1,385) believed that PRs sometimes crossed ethical boundaries.[11] In our postintervention survey, intervention residents were significantly more likely to agree that PRs sometimes cross ethical boundaries. These changes in attitude occurred despite the fact that the intervention did not label PR practices as unethical.

Residents in the postintervention survey were more likely to agree that marketing gifts with no benefit to patients may be inappropriate. This change reflects increased knowledge of the AMA guidelines on gifts to physicians from manufacturers. These guidelines state that, "Any gifts accepted by physicians individually should primarily entail a benefit to patients and should not be of substantial value."[16] A separate scale was used to test knowledge of the AMA guidelines in relation to marketing gifts with direct patient benefit, but residents in the preintervention and postintervention groups scored equally well in identifying appropriate gifts.

Our findings suggest that, without the intervention, residents may underestimate the potential for marketing gifts to influence prescribing practices. At baseline, residents in this study thought discussions with, and acceptance of, modest gifts from PRs were unlikely to alter their own prescribing practices. These results are consistent with previous work,[3,20] in which faculty and residents generally did not believe that their prescribing practices were influenced by discussions with, and acceptance of, promotional items from PRs. Residents in the preintervention survey of this study were neutral to the statement that other physicians could be influenced by the acceptance of marketing gifts. Residents who attended the intervention program showed an increased belief that the acceptance of marketing gifts might influence other physicians, but were not more likely to believe that their own prescribing patterns could be influenced. More persuasive interventions may be required to enable residents to recognize their own ability to be influenced.

A brief educational intervention by Vinson and colleagues showed significant changes in second-year medical

students' attitudes toward pharmaceutical marketing.[10] The changes they reported may represent the efforts of a more persuasive intervention, in which "faculty presented concerns about pharmaceutical marketing practices." Alternately, these findings may suggest the ability to influence individuals who are in the initial stages of medical training and have had less contact with PRs. The sample size of our study did not allow for measurement of differential effects across different years of residency training.

This study has several potential limitations. The sample size was limited to residents in our primary care training program. It is unknown whether the results of this study will generalize to other residency programs. The level of resident participation in the intervention could be viewed as a weakness of this method of education. The intervention occurred during a regularly scheduled educational session rather than as a special event. No attempt was made to increase attendance beyond what would naturally occur. In fact, the number of residents who attended is representative of the number of residents who typically attend our educational conferences. In addition, there is an increased probability of type I errors in our analysis because of the multiple statistical comparisons (24 comparisons) we report.

In summary, this study provides preliminary evidence that a brief educational intervention can change resident attitudes concerning physician interactions with PRs. The long-term effects of this intervention and effects on prescribing practices are not known. Future work should consider studying the effects of an intervention over time at different stages of training.

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