

Impact of Educational Intervention on Knowledge and Attitude of Undergraduate Medical Students Regarding Pharmaceutical Promotion

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Abstract

Background: Promotional activities conducted by pharmaceutical industries are highly successful to alter physicians' prescribing habit. Undergraduate medical curriculum does not make students to deal with this unwarranted effect. Educational intervention might be a key to address this crucial issue. The aim of this study was to evaluate the impact of educational intervention on knowledge and attitude of medical students regarding pharmaceutical promotion.

Materials and methods: This interventional research was conducted from February 2016 to February 2017. 4th year MBBS students of the four medical colleges of Dhaka city were the study population. A baseline assessment on knowledge and perception of the 4th year MBBS medical students' of the included medical colleges (Control and intervention) was conducted by a questionnaire survey. Number of respondents in control and intervention group was 156 and 243 respectively in pre test. Then, a package of educational intervention including interactive lecture and practical session was delivered to intervention group. After 1 month of intervention, post intervention data had been collected from undergraduate students to evaluate the effect of intervention on their knowledge and perception by using same questionnaire. Number of respondents in control and intervention group was 152 and 227 respectively in post test. Attitude of the undergraduate students of intervention group was evaluated by a structured questionnaire after one month of intervention. Total 227 students were participated in this survey.

Results: Proportion of students regarding knowledge and perception about pharmaceutical promotion is significantly increased after intervention ($p < 0.001$). Attitude of undergraduate students of intervention group on 10 different case scenarios related to pharmaceutical promotion have been changed after intervention and it were statistically significant in all 10 case scenarios.

Conclusion: The conducted educational intervention was found effective at undergraduate level to modify knowledge and attitude about pharmaceutical promotion.

Key words: Critical appraisal skill; Drug promotion; Educational intervention; Pharmaceutical promotion.

INTRODUCTION

From the very beginning, the relationship of physician-pharmaceutical industry is a controversial issue and there is always a concern about attitude and practice of physicians regarding promotional activities. The impact of promotion on physicians prescribing practice is enormous, ranging from the selection of inappropriate, unnecessary, costly medicine to low prescribing quality.^{1,2} Frequent interactions with

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industries and positive attitudes towards them have been related with less evidence-based prescribing of physicians.³ There are lots of controversies and no resolution or consensus yet achieved towards this direction. Various interventions have been taken throughout the world to control and regulate pharmaceutical promotional activities.^{1,4}

Educational intervention can be a key to address this problem. Immunity against misleading promotion can be attained by making physicians understand that they are vulnerable to the influence of promotion.⁵ Exposure of undergraduate medical students to promotional materials, enables them to differentiate ‘facts from fiction’, which in turn may reduce the pharmaceutical industry’s influence on prescribing. Moreover, medical students can be ‘vaccinated’ against the potential infection by irrational prescribing of their peer which they will encounter later.⁶ Sensitizing students about pharmaceutical promotion and helping them to understand about the standard of an ‘appropriate’ relationship with industry is the bottom line to be achieved.⁷ Preemptive education about promotional activities appears to change attitudes and improve skills.¹ World Health Organization (WHO) formulated two manuals titled “Guide to Good Prescribing” and “Teachers Guide to Good Prescribing”.⁶ In addition, the World Health Organization (WHO) and Health Action International (HAI) have developed a valuable resource titled Understanding and Responding to Pharmaceutical Promotion: A Practical Guide. This manual provides practical training for students to recognize a variety of promotion techniques and to know how to access quality, independent information about medicines. It has been considered as a first step to prepare medical professionals to deal with the effects of pharmaceutical marketing on decision-making in their patients’ interests and that can be incorporated into the medical curriculum.⁴ Nevertheless, very few countries in the world have adopted this issue in their formal medical curriculum.^{8,9}

Couple of educational interventions has been proposed to equip the physicians with a healthy dose of skepticism. Lecture or discussion on ethical and marketing issues in pharmaceutical promotion was successful in improving attitudes and knowledge of medical students as well as faculty members.¹⁰ Single workshop was successful to generate doubt or question among students about the accuracy and ethics of standard drug detailing, which was reiterated by the altered attitude of medical students regarding interactions with industry after a single workshop.^{11,12} Role play with simulated representatives was also used and found to be helpful for the students to understand the impact of unethical promotion.¹³ Different studies showed that critical appraisal of promotional materials can be a valuable addition to teaching programs in pharmacology.^{14, 15, 16}

In Bangladesh, 276 companies have marketed around 27000 products and pharmaceutical companies conduct promotional activities to increase market share of their products. Current regulatory framework of Bangladesh is not adequate to control

pharmaceutical promotion.^{17,18} Aggressive promotional activities are going on in such a manner that relationship between physician and pharmaceutical industry was labeled as ‘unholy alliances’ in a previous study.¹⁹ The printed promotional materials and advertisements in medical journals contain exaggerated claims and other deviations from the standard.^{20, 21, 22} In our country, the formal medical education program at undergraduate or postgraduate levels does not address the issue through attempts to achieve ‘Critical appraisal skill’.²³ On this backdrop, the present study has attempted to evaluate the impact of an educational intervention on knowledge and attitude of undergraduate medical students regarding pharmaceutical promotion.

MATERIALS AND METHODS

Study Design and Procedure

An Interventional Research was designed to meet the study objective and was conducted from February 2016 to February 2017. The research protocol got approval from the Institutional Review Board (IRB) of Bangabandhu Sheikh Mujib Medical University, Dhaka. Two government medical colleges (Sir Salimullah Medical College and Shaheed Suhrawardy Medical College) and two nongovernment medical colleges (Holy Family Red Crescent Medical College and Anwer Khan Modern Medical College) were selected as study place.

Pre Intervention Data Collection

4th year MBBS students of the included medical colleges were the study population. A baseline assessment on critical appraisal skill of the 4th year MBBS medical students’ of the included medical colleges (Control and intervention) was conducted by a questionnaire survey. Among four medical colleges, two were selected as control (Shaheed Suhrawardy Medical College and Anwer Khan Modern Medical College) and two were selected as intervention group (Sir Salimullah Medical College and Holy Family Red Crescent Medical College). Undergraduate students were briefed about nature and purpose of the study. Number of respondents in control and intervention group was 156 and 243 respectively.

Educational Intervention

A package of educational intervention including interactive lecture and practical session was delivered to intervention group. Educational intervention has been designed and formulated according to the principles and issues outlined in the manual developed by WHO and HAI on pharmaceutical promotion.⁴ 1-hour lecture titled ‘Pharmaceutical promotion: Immunization for preparedness’ has been delivered. In that lecture, aims and objectives of pharmaceutical promotion, different methods of pharmaceutical promotion (Medical representatives, promotional literature, gift and reminder articles, free medicine samples, free food, journal advertisement and CME) and techniques (Psychological and scientific) patterns and expenditure of pharmaceutical

promotion were discussed. Then biasness of educational materials and quality of those educational materials (Pharmaceutical promotional literature and journal advertisements) has been explained in details. Impact of pharmaceutical promotion and perception and attitudes of key opinion leaders regarding different promotional activities were also discussed. Then how pharmaceutical promotion has been regulated worldwide and Bangladesh including guidelines, Code of Pharmaceutical Marketing Practice was discussed. During this session, special emphasis was given on ethical obligations and ethical vulnerabilities of physician in relationship with pharmaceutical industry. Different ethics guidelines regarding 'Ethical relationship of physician-pharmaceutical industry' exercised around the world was discussed in details. Different unbiased sources of therapeutic information including text and web based were discussed. Discussion on Evidence-based medicine and critical appraisal skill was also included but less weightage was given in these topics as because of anticipated lack of knowledge and perception of undergraduate students in these topics. The web links of different non-profit organizations working to combat misleading pharmaceutical promotion and to encourage ethical practice among teachers and medical students were also provided as a self-directed learning of the students. Handout of the slides was distributed at the beginning of the session among the faculty members and students in order to engage students more in thinking of the concept rather than writing down. The lecture was taken for 40 minutes. At the end of the lecture class, faculty members and students of studied department participated in a question-answer session for 20 minutes. Participation in this question-answer session was totally voluntary.

1 week after the interactive lecture, a notice was served by the Head of the Department about a two-hour practical class. After notification, practical class of 2 hours session was conducted. Practical session was held during scheduled pharmacology practical class. Each practical group was divided into 5-6 small groups consisting of 4-5 students and spoke-person for each group was selected by the opinion of group members. This session included brainstorming session on different aspects of ethics and critical analysis of promotional literatures. Researcher acted as a facilitator for this session and one of the faculty members was also present. At first, Students were introduced with different types of promotional materials like full advertisement, abbreviated advertisement and product list. Then researcher explained the essential information needed to be present in a 'full advertisement' form of pharmaceutical promotional literature. Details discussion has been conducted on importance of evaluation of promotional claims and how to evaluate. Data presentation like graphs, charts was also discussed. Brief discussion has been done on types of documents cited as reference in promotional materials and their

level of evidence. Then different types of promotional literatures were distributed to the groups and students were asked to critically appraise them. Additional resources and information was also provided for decision making. After 10 minutes of group discussion, spoke-person of every group discussed about the strength and weakness of that particular promotional literature. And exaggerations, omissions and biasness of information of that particular promotional material were also identified. Members of the other groups also provided their opinion but very little difference of opinion was observed in this part of the session. Then, students were acquainted with different unbiased sources of therapeutic information both text-based and web-based; special emphasis was given on Bangladesh National Formulary. Next part of the session was conducted on ethical aspects and vulnerabilities in interaction of pharmaceutical industry. At first, medical ethics and moral science, and how interaction with industry imposes ethical vulnerabilities and harm was briefly discussed.

Then, a case scenario of a certain situation students going to be exposed in their future life was given to each group. Next 10 minutes, group members discussed about that particular problem among them. Then, spoke-person of each group presented their opinion about how would they handle this particular situation in their practical life, and members of other groups were allowed to express their agreement or disagreement on that issue. In this session, students were appeared to be successful to hold the same opinion on most of the discussed issues, though disagreements were also observed in few occasions. After the end of the session, students expressed their confidence to encounter pharmaceutical promotion ethically and scientifically in their practice life.

Post Intervention Data Collection

After 1 month of intervention, post intervention data had been collected from undergraduate students to evaluate the effect of intervention on their knowledge and perception by using questionnaire. Number of respondents in control and intervention group was 152 and 227 respectively.

Attitude of the undergraduate students of intervention group was evaluated by a structured questionnaire after one month of intervention. Total 227 students were participated in this survey. Questionnaire was designed to assess student's attitudes towards different promotional activities like promotional literature, gift, sample and sponsored programs group in hypothetical situation. It was assumed that as undergraduate students are not familiar with different promotional activities, this questionnaire survey was done after intervention where self-evaluation of change of attitude due to intervention was assessed.

Appropriate statistical test (Z-test of proportion, paired t-test and unpaired t-test) was done in this study for drawing an appropriate conclusion. Statistical analysis was done with Microsoft Office Excel 2007.

RESULTS

Table I showed that proportion of students knowledge and perception about pharmaceutical promotion in significantly increased after intervention ($p < 0.001$) and was higher in the post-intervention response of intervention group than that of control group ($p < 0.001$). However, there was no significant difference between control and intervention group at baseline or between the before and after response of control group.

Table I Knowledge and perception of the Students regarding pharmaceutical promotion

Items	Respondents	Before	After	p value
Knowledge about unbiased sources of information	Control group	10.3% (16/156)	8.6% (13/152)	0.61 ^a
	Intervention group	11.1% (27/243)	37.9% (86/227)	<0.001 ^b
	p value	0.79 ^c	<0.001 ^d	
Awareness about provision of therapeutic information by pharmaceutical industries	Respondents	Before	After	p value
	Control group	35.3% (55/156)	32.5% (49/152)	0.58 ^a
	Intervention group	34.2% (83/243)	63.9% (145/227)	<0.001 ^b
p value	0.82 ^c	<0.001 ^d		
Perception of students about their ability to validate information provided by pharmaceutical industries	Respondents	Before	After	p value
	Control group	11.6% (18/156)	11.2% (17/152)	0.92 ^a
	Intervention group	11.1% (27/243)	41.4% (94/227)	<0.001 ^b
p value	0.89 ^c	<0.001 ^d		
Awareness about different promotional techniques used by pharmaceutical industries	Respondents	Before	After	p value
	Control group	25.0% (39/156)	29.6% (45/152)	0.36 ^a
	Intervention group	30.9% (75/243)	70.5% (160/227)	<0.001 ^b
p value	0.20 ^c	<0.001 ^d		
Awareness about the impact of promotion on prescribing practice	Respondents	Before	After	p value
	Control group	37.2% (58/156)	37.5% (57/152)	0.95 ^a
	Intervention group	42.0% (102/243)	64.3% (146/227)	<0.001 ^b
p value	0.24 ^c	<0.001 ^d		
Awareness about the ethical vulnerability of the physician-industry relationship	Respondents	Before	After	p value
	Control group	44.2% (69/156)	38.8% (59/152)	0.33 ^a
	Intervention group	40.3% (98/243)	60.4% (137/227)	<0.001 ^b
p value	0.44 ^c	0.003 ^d		

- a = Compared between before and after of Control group
 - b = Compared between before and after of Intervention group
 - c = Compared between Control and Intervention before
 - d = Compared between Control and Intervention after
- 2 proportion Z test was done, $p \leq 0.05$ = Statistically significant.

Table II showed that according to the response of undergraduate students of intervention group, their attitude on 10 different case scenarios related to pharmaceutical promotion have been changed after intervention in comparison to a hypothetical proposition of if they were exposed to the same before and the differences were statistically significant in all 10 case scenarios.

Table II Attitudes of the Undergraduate Medical Students Regarding Interaction with Pharmaceutical Industry

Case scenarios	Mean ± SD	Mean ± SD	p value
	Before (n=227)	After (n=227)	
Pharmaceutical promotional literature	2.09 ± 1.01	2.94 ± 1.02	< 0.001
Pen and writing pad	2.29 ± 1.09	3.47 ± 0.75	< 0.001
Calendar and coffee mug	2.35 ± 1.10	3.50 ± 0.77	< 0.001
32 GB pen drive	2.29 ± 1.19	3.37 ± 0.96	< 0.001
QIMP (Formulary)	2.01 ± 1.02	2.73 ± 1.10	< 0.001
Medicine sample	2.17 ± 1.11	3.03 ± 1.00	< 0.001
CME program	2.28 ± 1.12	3.18 ± 0.94	< 0.001
Inauguration program in restaurant	2.17 ± 1.12	3.12 ± 1.01	< 0.001
Launching ceremony program in buffet restaurant	2.22 ± 1.11	3.26 ± 0.97	< 0.001
Tour to Sundarban	2.12 ± 1.13	3.15 ± 1.02	< 0.001

Paired t-test was done, $p \leq 0.05$ = Statistically significant.

1= Certainly accept/ participate, 2= Probably accept/ participate, 3= Probably not accept/ participate, 4= Never accept/ participate.

DISCUSSION

About one third (30.9%) of the undergraduate student were aware about different promotional techniques despite absence of this issue in the curriculum. This may be due to the fact that as 4th year medical students were already in their clinical rotation, where they may already interacted with industry or observed different promotional techniques or they already knew this issue from their senior peers.²⁴ Significant improvement in knowledge and perception was observed in intervention group but control group remained unchanged. Attitudes and analytical skill of undergraduate students towards different promotional activities were significantly changed following the intervention. An earlier study conducted in Nepal found that introduction of a module incorporating different topics related with pharmaceutical promotion is effective in improving knowledge, attitude and skill of undergraduate students.²⁵ After attending an educational program, more skeptic attitudes about pharmaceutical promotion among participants correspond with findings of previous study.²⁶ One interesting point is to be noted that more positive attitudes towards educational materials persists even after educational intervention as because of educational materials are considered as more ethically appropriate to accept throughout the world.^{27, 28, 29}

Current study found effectiveness of educational intervention to sensitize students against promotional strategies, and could be used for creating awareness of, increasing skepticism towards, and inculcating disapproval about promotional activities. But it's not obvious how long this impact will be remained among the studied population. The impact of role-models,

organizational culture, and institutional policies could be important aspects to be addressed for sustaining the effectiveness of such education programs as an effective educational program can lose its durability in the clinical environment.³⁰

CONCLUSION

The conducted educational intervention was found effective at undergraduate level to modify knowledge and attitude about pharmaceutical promotion. This educational intervention should be further studied in diverse contexts and based on the findings couple of modules can be developed especially customized for the purposes. Integration of education about pharmaceutical promotion in undergraduate pharmacology curriculum is the need of the hour.

DISCLOSURE

All the authors declared no competing interest.

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