

## Pharmaceutical Promotions Impact on Prescribing Behavior of Primary Health Care Physicians: Taif Experience, Saudi Arabia

Ammar Eid Nahhas<sup>1</sup>, Faisal Eid Nahhas<sup>2\*</sup>, Saadallah Jaber Alzahrani<sup>2</sup>,  
Musab Mohammed Alnefaie<sup>2</sup>, Abdullah Sameer Basaba<sup>2</sup>,  
Bassam Awadh Suliman Alhejaili<sup>3</sup>, Faisal Fahad Mohammed Alharth<sup>2</sup>

<sup>1</sup>National Guard Health Affairs, Taif, Saudi Arabia.

<sup>2</sup>Interns, Faculty of Medicine, Taif University, Saudi Arabia.

<sup>3</sup>Al-Safa Primary Health Care Center, Ministry of Health, Jeddah, Saudi Arabia.

### ABSTRACT

**Background:** Identifying prescribing-associated factors is of paramount interest from health, as much as social and economic standpoints.

**Objectives:** To assess drug companies' influence on physician's prescription pattern as well as physician's attitudes toward drug companies and to study other factors that may affect the prescribing behavior of physicians.

**Subjects and Methods:** A cross-sectional study was conducted among primary health care physicians, Taif city, KSA. A structured self-administered questionnaire was utilized for data collection. It included the personal data of the participants, practice experience of the PHC physicians, factors influencing prescribing of a new drug including gifts offered by drug representatives, reference sources used for prescribing, educational experience including CME hours sponsored by drug representatives and physicians' beliefs about impact of pharmaceutical companies on prescribing.

**Results:** The study included 88 physicians with a response rate of 84.6%. Almost one third of them aged between 35 and 44 years (30.7%) and another one third aged 50 years and over (30.7%). More than one half of them were females (52.9%). More than three-quarters of them (78.4%) were non-Saudis. Majority of physicians (96.6%) agreed that they were affected by drug characteristics such as adverse effect, indication and efficacy and guidelines updating (93.2%) in their prescribing behaviors. Most of them agreed that they were affected by patients' factors such as failure of current therapy and prescription requests (77.3%) as well as opinion of specialists or hospital physicians (76.1%) in their prescribing behaviors. Only 33% agreed that they were affected by drug representatives in their prescribing behavior. In case of any problem in prescription, physicians frequently or often

consulted textbooks (80.7%), followed by documents and drug guides from drug representative (63.6%). Minority of physicians (ranged between 4.5% and 6.8%) agreed that gifts offered by drug representatives affected their prescription of a certain drug. More than one third (39.5%) of physicians working in PHCCs, MOH and 31.4% of those working in military hospitals compared to only 10% of those working in National Guard agreed that their prescription of a new drug is influenced by drug representative,  $p < 0.001$ . More than half of non-Saudi physicians (55.1%) compared to 31.6% of Saudis disagreed that their prescription of a new drug is influenced by drug representative,  $p = 0.027$ .

**Conclusions:** Almost one third of primary care physicians in Taif were influenced by drug representative promotions that could affect their prescribing patterns. Most of them were not affected by gifts given by the representatives.

**Keywords:** Pharmaceutical Promotions; Drug Companies, Primary Health Care, Physicians.

### \*Correspondence to:

Faisal Eid Nahhas,  
Faculty of Medicine, Taif University,  
Taif, Saudi Arabia.

### Article History:

Received: 22-11-2016, Revised: 21-12-2016, Accepted: 27-12-2016

Access this article online	
Website: <a href="http://www.ijmrp.com">www.ijmrp.com</a>	Quick Response code 
DOI: 10.21276/ijmrp.2017.3.1.004	

### INTRODUCTION

Identifying prescribing-related factors among physicians is of great interest from health, as much as social and economic concerns.<sup>1</sup> In Western Europe, drug were prescribed for more than 60% of the population<sup>2,3</sup> compared to 75 % in Saudi Arabia.<sup>4</sup>

Appropriate prescribing is a balance of a whole profile of patient including personal characteristics, needs, social and disease status as well as the choice of medication.<sup>5</sup>

There are many factors that affect prescribing behavior other than scientific knowledge.<sup>6</sup> Some of these factors are scientific journal articles that reports drug characteristics,<sup>7</sup> level of education,<sup>8</sup> doctor's and patient's profile,<sup>9</sup> behavior of other physicians,<sup>10</sup> patient's requests for medication,<sup>11-13</sup> advertising in medical journals and pharmaceutical company promotions<sup>11-15</sup> and higher number of patients examined per day.<sup>16</sup>

Physicians believed that commercial sources had little effect on 68% of them while 54% of them believed that pharmaceutical representatives were minimally important in choosing prescriptions. In comparison 62% believed scientific evidence was very important in influencing their prescribing behavior. However, 88% of physicians believed that training and clinical experience was the most important factor in their prescribing habits.<sup>17</sup>

Drug companies claim that their activities provide scientific information including benefits and risks of their products,<sup>18</sup> although it is known that some of these information are selective and provide inadequate knowledge about their safety in the community. Furthermore, for developing countries' doctor, the quality of drug information given is poorer than those in developed countries.<sup>19</sup>

Research conducted on physicians attitudes and believes indicates that they are often unaware of potential impact of pharmaceutical companies' activities on their attitudes and behaviors.<sup>20-22</sup>

Although the interactions between physicians and drug companies raise scientific and ethical questions in Saudi Arabia, little has been published in assessing the impact of drug companies' promotion on physicians' decisions. This study aimed to investigate the impact of drug companies' promotions on primary health care physicians' decisions and clinical behaviour.

**SUBJECTS AND METHODS**

A cross-sectional study was conducted among primary health care physicians, Taif city, KSA. Taif city is located at the West of Saudi

Arabia. It is located in the Makkah Province at an elevation of 1700 meters above sea level.

The study population consisted of all primary health care (PHC) physicians from both genders and all nationalities, working in Taif city. The estimated number was 104 physicians distributed as 40 physicians working in military hospitals (Prince Mansour Family medicine center and Al-Hada Armed Forces hospital family medicine clinics), 12 physicians working in the PHC clinics of the National Guard hospital and 52 physician working in 17 primary health care centers (PHCCs) belonging to ministry of health (MOH).

A structured self-administered questionnaire was utilized for data collection. It has been proved to be valid and reliable and used in another Saudi study conducted in Riyadh.<sup>23</sup> The questionnaire included the personal data of the participants: (Age, gender, nationality, qualification, and job title), practice experience of the PHC physicians, factors influencing prescribing of a new drug including gifts offered by drug representatives, reference sources used for prescribing, educational experience including CME hours sponsored by drug representatives and physicians' beliefs about impact of pharmaceutical companies on prescribing.

Approval by the Research and Ethics Committee at Al-Hada Armed Forces hospital was obtained prior to the study.

Statistical entry and analysis were performed using the Statistical Package for Social Science (SPSS), version 20. Data were presented as frequency and percentage since all of our data are categorized. Differences were tested using  $\chi^2$  tests. A p-value less than 0.05 was considered statistically significant.

**Table 1: Socio-demographic and practice-related characteristics of the 88 physicians participated in the study.**

Variables		No.	%
Age (years)	25-34	21	23.9
	35-44	27	30.7
	45-49	13	14.8
	≥50	27	30.7
Gender	Male	40	47.1
	Female	48	52.9
Nationality	Saudi	19	21.6
	Non-Saudi	69	78.4
Qualification	MBBS	46	52.3
	Diploma	8	9.1
	Master	7	8.0
	PhD or Board	27	30.7
Job title	GP	46	52.3
	Registrar	11	12.5
	Specialist	20	22.7
	Consultant	11	12.5
Years of practice after MBBS	≤5	17	19.3
	6-10	8	9.1
	>10	63	71.6
No. of patients seen per day	<20	25	28.4
	21-30	19	21.6
	31-40	20	22.7
	>40	24	27.3
Time spent per patient In minutes	5-10	36	40.9
	11-15	47	53.4
	>15	5	5.7
Prescribing drugs not available at hospital pharmacy	Sometimes	26	29.5
	Rarely	54	61.4
	Never	8	9.1

**Table 2: Factors that influencing physicians' prescription of a new drug.**

Factors	Agree N (%)	Don't know N (%)	Disagree N (%)
▪ Drug characteristics (e. g adverse effect, indication, efficacy.)	85 (96.6)	2 (2.3)	1 (1.1)
▪ Journal articles on new drugs	55 (62.5)	21 (23.9)	12 (13.6)
▪ Guidelines updating	82 (93.2)	4 (4.5)	2 (2.3)
▪ Opinion of specialists or hospital physicians	67 (76.1)	12 (13.6)	9 (10.2)
▪ CME	63 (71.6)	19 (21.6)	6 (6.8)
▪ Colleagues e. g other GPs	42 (47.7)	21 (23.9)	25 (28.4)
▪ Drug representatives	29 (33.0)	15 (17.0)	44 (50.0)
▪ Patients factors (e. g failure of current therapy, prescription requests...)	68 (77.3)	12 (13.6)	8 (9.1)

**Table 3: Effect of drug representatives visits on physicians' prescribing pattern.**

	No.	%
<b>Frequency of drug representatives visits to physicians (n=74)</b>		
More than once per week	3	4.1
Once per week	18	24.3
Monthly	18	24.3
Less frequently	35	47.3
<b>Information gained about certain drug from drug representatives</b>		
Agree	149	22.7
Don't know	16	18.2
Disagree	23	26.1
<b>Confirming accuracy of information given by drug representative before prescribing their drugs (n=83)</b>		
Never	10	12.0
Rarely	5	6.0
Sometimes	38	45.8
Always	30	36.2
<b>Prescription of a specific drug affected after the visit of a drug representative</b>		
I don't know	8	9.0
Yes	7	8.0
May be	46	52.3
No	27	30.7
<b>Other physicians' prescribing pattern affected by drug representatives' influence</b>		
I don't know	24	27.3
Always	6	6.8
Sometimes	50	56.8
Never	8	9.1
<b>The gender of a drug representative influenced physicians' prescribing behavior or decision</b>		
I don't know	9	10.2
Yes	3	3.4
May be	9	10.2
No	67	76.1

**RESULTS**

The questionnaires were distributed over 104 physicians. Out of them, 88 returned completed questionnaire. Thus, the response rate was 84.6%. The participated physicians were recruited from three main work places in Taif; primary health care centers, MOH (48.9%), military hospitals (39.8%) and National Guard hospital (11.4%). Table 1 presents their socio-demographic characteristics. Almost one third of them aged between 35 and 44 years (30.7%) and another one third aged 50 years and over (30.7%). More than one half of them were females (52.9%). More than three-quarters of them (78.4%) were non-Saudis. More than half of them (52.3%) were MBBS holders whereas 30.7% of them were PhD or Board holders. More than half of them (52.3%) were general practitioners

whereas 12.5% were consultants. Most of them (71.6%) had practical experience of more than 10 years. More than one quarter of them (27.3%) have seen more than 40 patients per day. More than half of them (53.4%) spent between 11 and 15 minutes per patients. Regarding prescription of drugs not available at hospital pharmacy, 29.5% of physicians reported that they sometimes prescribed non-available drugs.

As illustrated in table 2, majority of physicians (96.6%) agreed that they were affected by drug characteristics such as adverse effect, indication and efficacy and guidelines updating (93.2%) in their prescribing behaviors. Most of them agreed that they were affected by patients' factors such as failure of current therapy and prescription requests (77.3%) as well as opinion of specialists or

hospital physicians (76.1%) in their prescribing behaviors. Only 33% agreed that they were affected by drug representatives in their prescribing behavior.

In case of any problem in prescription, physicians frequently or often consulted textbooks (80.7%), followed by documents and drug guides from drug representative (63.6%) and consultation with specialist 56.8%. More than half of the physicians (53.4%) attended more than 30 CME hrs per year. Slightly less than half of them (46.4%) reported that all of these CME hours were self-sponsored.

Almost a quarter of physicians (26.1%) attended more than 5 lectures/symposia whereas 44.3% did not attend any lectures/symposia sponsored by drug companies in the last year. More than half of the physicians (50.6 %) of physicians accepted meals from drug representatives whereas 41.9% of them accepted office samples. Drug samples and educational gifts were

accepted by 36% and 27.1% of them, respectively whereas only 20.9% of them accepted trips. Minority of physicians (ranged between 4.5% and 6.8%) agreed that gifts offered by drug representatives affected their prescription of a certain drug.

From table 3, it is demonstrated that 24.3% of physicians were visited by drug representatives once per week and another 24.3% of them visited by them monthly. Nearly 23% of physicians thought that they gain more information about a certain drug from drug representatives and 36.2% of physicians claimed that they always confirming the accuracy of the information given to them. Most of the physicians (83%) reported that their prescription was not affected by visits of drug representatives or may be affected while 56.8% of them believed that other physicians' prescribing pattern is sometimes affected by drug representatives' influence. Most of them (76.1%) reported that their prescription behavior is not influenced by gender of a drug representative.

**Table 4: Association between socio-demographic characteristics and influence of drug representative in prescribing new drug**

	Influence of drug representative in prescribing new drug			χ <sup>2</sup> -value	p-value
	Agree n=29 N (%)	Not sure n=15 N (%)	Disagree n=44 N (%)		
<b>Work place</b>					
Military (n=35)	11 (31.4)	0 (0.0)	24 (68.6)	23.52	<0.001
National Guard (n=10)	1 (10.0)	6 (60.0)	3 (30.0)		
PHCCs (n=43)	17 (39.5)	9 (20.9)	17 (39.5)		
<b>Age (years)</b>					
25-34 (n=21)	4 (19.0)	6 (28.6)	11 (52.4)	8.41	0.210
35-44 (n=27)	9 (33.3)	2 (7.4)	16 (59.3)		
45-49 (n=13)	3 (23.1)	3 (23.1)	7 (53.8)		
≥50 (n=27)	13 (48.1)	4 (14.8)	10 (37.0)		
<b>Gender</b>					
Male (n=40)	14 (35.0)	8 (20.0)	18 (45.0)	0.84	0.659
Female (n=48)	15 (31.3)	7 (14.6)	26 (54.2)		
<b>Nationality</b>					
Saudi (n=19)	6 (31.6)	7 (36.8)	6 (31.6)	7.23	0.027
Non-Saudi (n=69)	23 (33.3)	8 (11.6)	38 (55.1)		
<b>Qualification</b>					
MMMS (n=46)	13 (28.3)	9 (19.6)	24 (52.2)	3.23	0.779
Diploma (n=8)	3 (37.5)	1 (12.5)	4 (50.0)		
Master (n=7)	4 (57.1)	0 (0.0)	3 (42.9)		
PhD/Board (n=27)	9 (33.3)	5 (18.5)	13 (48.1)		
<b>Job title</b>					
General practitioner (n=46)	14 (30.4)	10 (21.7)	22 (47.8)	7.93	0.243
Registrar (n=11)	9 (45.0)	4 (20.0)	7 (35.0)		
Specialist (n=20)	2 (18.2)	0 (0.0)	9 (81.8)		
Consultant (n=11)	4 (36.4)	1 (9.1)	9 (54.5)		

As shown in table 4, among studied `socio-demographic characteristics of the physicians, only work place and nationality were significantly associated with influencing of drug representative in prescribing new drug as more than one third (39.5%) of those working in PHCCs, MOH and 31.4% of those working in military hospitals compared to only 10% of those working in National Guard agreed that their prescription of a new drug is influenced by drug representative. This difference was statistically significant, p<0.001.

Mora than half of non-Saudi physicians (55.1%) compared to 31.6% of Saudis disagreed that their prescription of a new drug is influenced by drug representative. The difference was statistically significant, p=0.027.

Other socio-demographic characteristics of the physicians (age, gender, qualification and job title) were not significantly associated with influence of drug representative in prescribing new drug. (Table 4)

As demonstrated in table 5, although 39.7% of physicians who had more than 10 years of experience after MBBS compared to 17.7% of those who had 5 years or less of experience agreed that their prescription of a new drug is influenced by drug representative, this was not statistically significant. Other studied factors (number of patients seen per day, time spent per patient in minutes and prescribing drugs not available at hospital pharmacy) were not significantly associated with influence of drug representative in prescribing new drug.

As demonstrated in table 6, physicians who were not sure if office supplies are an acceptable gift were likely to prescribe a drug based on drug representative influence compared to those who agreed or disagreed with that (72.7% versus 40% and 59.7%,

respectively). This difference were statistically significant,  $p=0.034$ . Acceptance of sponsored lectures, drug samples, trip gifts and meal gifts were not significantly associated with influence of drug representative on physician's prescription.

**Table 5: Association between practice-related characteristics and influence of drug representative in prescribing new drug**

	Influence of drug representative in prescribing new drug			$\chi^2$ -value	p-value
	Agree	Not sure	Disagree		
	n=29 N (%)	n=15 N (%)	n=44 N (%)		
<b>Years of practice after MBBS</b>					
≤5 (n=17)	3 (17.7)	5 (29.4)	9 (52.9)	5.96	0.202
6-10 (n=8)	1 (12.5)	2 (25.0)	5 (62.5)		
>10 (n=63)	25 (39.7)	8 (12.7)	30 (47.6)		
<b>No. of patients seen per day</b>					
<20 (n=25)	10 (40.0)	5 (20.0)	10 (40.0)	6.89	0.331
21-30 (n=19)	5 (26.3)	1 (5.3)	13 (68.4)		
31-40 (n=20)	6 (30.0)	6 (30.0)	8 (40.0)		
>40 (n=24)	13 (48.1)	3 (12.5)	13 (54.2)		
<b>Time spent per patient in minutes</b>					
5-10 (n=36)	11 (30.6)	7 (19.4)	18 (50.0)	2.44	0.656
11-15 (n=47)	17 (36.2)	8 (17.0)	22 (46.8)		
>15 (n=5)	1 (20.0)	0 (0.0)	4 (80.0)		
<b>Prescribing drugs not available at hospital pharmacy</b>					
Sometimes (n=26)	14 (53.8)	4 (15.4)	8 (30.8)	9.23	0.056
Rarely (n=54)	12 (22.2)	9 (16.7)	33 (61.1)		
Never (n=8)	3 (37.5)	2 (25.0)	3 (37.5)		

**Table 6: Relationship between gifts offered by drug representative & physicians' prescribing affected by them.**

Frequency of drug representatives' visits	Prescribing affected by drug representative			$\chi^2$ -value	p-value
	Yes/may be	No	Not sure		
	n=53 N (%)	n=27 N (%)	n=8 N (%)		
<b>Sponsored Lectures</b>					
None (n=39)	23 (59.0)	11 (28.2)	5 (12.8)	5.63	0.465
1-2 (n=18)	12 (66.7)	6 (33.3)	0 (0.0)		
3-5 (n=8)	4 (50.0)	2 (25.0)	2 (25.0)		
>5 (n=23)	14 (60.9)	8 (34.8)	1 (4.3)		
<b>Office supplies acceptable</b>					
Agree (n=5)	2 (40.0)	3 (60.0)	0 (0.0)	10.39	0.034
Not sure (n=11)	8 (72.7)	0 (0.0)	3 (27.3)		
Disagree (n=72)	43 (59.7)	24 (33.3)	5 (6.9)		
<b>Drug sample as gifts acceptable</b>					
Agree (n=6)	4 (66.7)	2 (33.3)	0 (0.0)	6.51	0.164
Not sure (n=13)	9 (69.2)	1 (7.7)	3 (23.1)		
Disagree (n=69)	40 (58.0)	24 (34.8)	5 (7.2)		
<b>Trip gifts as acceptable</b>					
Agree (n=4)	2 (50.0)	2 (50.0)	0 (0.0)	1.29	0.863
Not sure (n=15)	10 (66.7)	4 (26.7)	1 (6.7)		
Disagree (n=69)	41 (59.4)	21 (30.4)	7 (10.1)		
<b>Meal gift as acceptable</b>					
Agree (n=6)	4 (66.7)	2 (33.3)	0 (0.0)	1.03	0.905
Not sure (n=16)	10 (62.5)	4 (25.0)	2 (12.5)		
Disagree (n=66)	39 (59.1)	21 (31.8)	6 (9.1)		

**DISCUSSION**

Prescription of medication is one of the most important factors in the raising costs of health services. There are many factors that affect the prescribing behavior other than the scientific knowledge. One of these factors is pharmaceutical company promotions.

The pharmaceutical industry in Saudi Arabia as well as in most countries all over the world depends heavily on prescription from doctors because the typical hospital patients do not make a choice but depends on the opinion of the doctor and as such, the key to

drug sales lies on influencing the physician. To convince the doctors, strategies such as research funding, sponsorship to local and international conferences and training programmes, drug lunch/ dinner meetings are employed. There are other less expensive methods such as use of stickers, free drug samples and gift items to the doctors. There is a wide range of evidence suggesting that drug promotion affects attitude and behaviour of doctors.<sup>24-26</sup>

The aim of the present study was to explore the impact of pharmaceutical promotions on physicians' prescribing behavior among PHC physicians of different sectors (MOH, military and National Guard) in Taif city, KSA.

According to self-report of physicians, the prescribing behavior of almost one third of them was not affected by visits of drug representatives. However, more than half of them stated their prescribing behavior may be affected and only 8% of them stated that their behavior was affected. This finding was similar to those of other studies where drug representatives' visits were not believed by physicians to affect their prescribing behavior and only small number of physicians reported a change in prescribing behavior as a result.<sup>19,23,27,28</sup>

For those physicians who were not affected by drug representative, the reason may be because drug representative visits were less frequent to them, or may be this result does not reflect the true nature of physicians' attitude towards drug representatives since there were many studies that showed evidence suggesting that drug promotion does positively affect attitude and behavior of doctors.<sup>16,24,29</sup>

In the current study, physicians working in National Guard sector were less influenced by drug representative compared to those of military and MOH sectors. This could be due to the fact that all of those physicians were Saudis as also in our study, Saudi physicians were less influenced by drug representatives. The same finding has been reported in another study conducted recently in Riyadh.<sup>23</sup>

There might be an underestimation of the effect of pharmaceutical promotion on the prescribing decision of physicians in the present study or this could be related to the rules and regulations of some institutes regarding prescribing and dealing with drug representatives that limit their influence. As mentioned before, more than half of physicians stated that might be affected by drug representatives' visits and almost one third of them were not affected. That can be explained by the fact that they were uncertain about the influence of pharmaceutical promotion or they were unsure about their behavior towards them.

In the present study, there was no statistical association between socio-demographic data of physicians (with the exception of nationality) and drug representative's influence in prescribing new drugs. Unlike Prosser et al, where they found that if GP's were working at PHC centers and had an experience of less than 5 years after graduation, they were more likely to be influenced by drug representatives.<sup>16</sup> We did not find any association between practice-related characteristics of physicians such as busy clinics or limited time-per-patient and drug representative's influence in prescribing new drugs which is also an opposite to finding reported in Prosser study.<sup>16</sup> However, this was in agreement with finding of Al-Zahrani study.<sup>23</sup>

The most accepted gifts by physicians in our study were meals, office supplies and drug samples which was in agreement with

other studies.<sup>23,30</sup> In our study, all of these gifts had an influence on prescribing habits of physicians which was influenced only by information gained about certain drug from drug representatives.

In the current study, more than half physicians attended more than 30 CME hrs/ year following the recommendation from Saudi commission for physician registration and although approximately 60% of physicians attended sponsored lectures in the last year, there was no association between attending sponsored lectures and influence of prescribing behaviors. The explanation behind these findings may be because our study was conducted in institutes that offered these sponsored activities to their physicians with no direct relationship with drug representatives and that there were strong policies regarding drug representatives' visits and prescribing process in most of these institutes in Taif.

This study has some important limitations that should be mentioned and discussed. First, the results of the study cannot be generalized since there are many factors that affect these results such as character of some institutes such as National Guard and military hospitals with their rules, regulations, and restrictions of pharmaceutical promotion that may control physicians' attitude and behavior towards them leading to less impact than what is seen elsewhere. Second, the finding of this descriptive study was based on self-report of physicians about the impact of pharmaceutical promotion on their prescribing behavior. The reliance on self-report is a limiting issue of studies similar to our study. Finally, its cross-sectional design that could affect the cause-effect relationship. Despite of these limitations, this study has an importance to open up this area of research and to provide guidance to other researchers who may wish to develop these analyses in other areas of KSA.

In conclusion, almost one third of primary care physicians in Taif were influenced by drug representative promotions that could affect their prescribing patterns. Most of them were not affected by gifts given by the representatives.

## REFERENCES

1. Granja M. Dangerous liaisons-physicians and pharmaceutical sales representatives. *Acta Med Port* 2005;18(1):61-68.
2. Forder AA. How best to utilize limited resources. *J Hosp Infect.* 1995 Jun;30 Suppl:15-25.
3. Kroenke K. Polypharmacy. Causes, consequences, and cure. *Am J Med.* 1985 Aug;79(2):149-52.
4. Fraser RC, Gosling JT. Information systems for general practitioners for quality assessment: II. Information preferences of the doctors. *BMJ.* 1985 1985-11-30 00:00:00;291(6508):1544-6.
5. Al-Faris EA, al-Dayel MA, Ashton C. The effect of patients' attendance rate on the consultation in a health centre in Saudi Arabia. *Fam Pract.* 1994 Dec;11(4):446-52.
6. Barber N, Bradley C, Barry C, Stevenson F, Britten N, Jenkins L. Measuring the appropriateness of prescribing in primary care: are current measures complete? *J Clin Pharm Ther.* 2005 Dec;30(6):533-9.
7. Ladd EC, Mahoney DF, Emani S. "Under the radar": nurse practitioner prescribers and pharmaceutical industry promotions. *Am J Manag Care.* 16(12):e358-62.
8. McGettigan P, Golden J, Fryer J, Chan R, Feely J. Prescribers prefer people: The sources of information used by doctors for prescribing suggest that the medium is more important than the message. *Br J Clin Pharmacol.* 2001 Feb;51(2):184-9.

9. Wilson RP, Hatcher J, Barton S, Walley T. Influences of practice characteristics on prescribing in fundholding and non-fundholding general practices: an observational study. *BMJ*. 1996 Sep 7;313(7057):595-9.
10. Gill PS, Dowell A, Harris CM. Effect of doctors' ethnicity and country of qualification on prescribing patterns in single handed general practices: linkage of information collected by questionnaire and from routine data. *BMJ*. 1997 Dec 13;315(7122):1590-4.
11. Allery LA, Owen PA, Robling MR. Why general practitioners and consultants change their clinical practice: a critical incident study. *BMJ*. 1997 Mar 22;314(7084):870-4.
12. Fischer MA, Keough ME, Baril JL, Saccoccio L, Mazor KM, Ladd E, et al. Prescribers and pharmaceutical representatives: why are we still meeting? *J Gen Intern Med*. 2009 Jul;24(7):795-801.
13. Avorn J, Solomon DH. Cultural and economic factors that (mis)shape antibiotic use: the nonpharmacologic basis of therapeutics. *Ann Intern Med*. 2000 Jul 18;133(2):128-35.
14. Chren MM, Landefeld CS. Physicians' behavior and their interactions with drug companies. A controlled study of physicians who requested additions to a hospital drug formulary. *JAMA*. 1994 Mar 2;271(9):684-9.
15. Prosser H, Walley T. Understanding why GPs see pharmaceutical representatives: a qualitative interview study. *Br J Gen Pract*. 2003 Apr;53(489):305-11.
16. Prosser H, Almond S, Walley T. Influences on GPs' decision to prescribe new drugs-the importance of who says what. *Fam Pract*. 2003 Feb;20(1):61-8.
17. Vancelik S, Beyhun NE, Acemoglu H, Calikoglu O. Impact of pharmaceutical promotion on prescribing decisions of general practitioners in Eastern Turkey. *BMC Public Health*. 2007;7:122.
18. Pharmaceutical R, Manufacturers A. Code on Interactions with Healthcare Professionals. Washington (DC): Pharmaceutical Research and Manufacturers Association. 2008. Available at: [http://phrdocs.phrma.org/sites/default/files/pdf/phrma\\_marketing\\_code\\_2008.pdf](http://phrdocs.phrma.org/sites/default/files/pdf/phrma_marketing_code_2008.pdf). [last cited January, 2008]
19. Rane W. How ethical is the pharmaceutical industry in India. *Rational Drug Bulletin*. 1998;8(4):4-5.
20. Holmes DR, Jr., Firth BG, James A, Winslow R, Hodgson PK, Gamble GL, et al. Conflict of interest. *Am Heart J*. 2004 Feb;147(2):228-37.
21. McCormick BB, Tomlinson G, Brill-Edwards P, Detsky AS. Effect of restricting contact between pharmaceutical company representatives and internal medicine residents on posttraining attitudes and behavior. *JAMA*. 2001 Oct 24-31;286(16):1994-9.
22. Steinman M A, Shlipak M G, McPhee S J. Of principles and pens: attitudes and practices of medicine housestaff toward pharmaceutical industry promotions. *Am J Med*. 2001 May;110(7):551-7.
23. Al Zahrani HS. The impact of pharmaceutical promotions on primary health care physicians' prescribing behavior in KAMC in central region. *Inter J Med Sci and Public H*. 2014;3(2):355-361
24. Morgan MA, Dana J, Loewenstein G, Zinberg S, Schulkin J. Interactions of doctors with the pharmaceutical industry. *J Med Ethics*. 2006 Oct;32(10):559-63.
25. Adair RF, Holmgren LR. Do drug samples influence residents' prescribing behavior? A randomized controlled trial. *Am J Med*. 2005; 118: 881-884.
26. Castresana L, Mejia R, Aznar M. The attitude of physicians regarding the promotion strategies of the pharmaceutical industry. *Medicina (B Aires)*. 2005; 65(3): 247-251.
27. Chimonas S, Brennan TA, Rothman DJ. Physicians and drug representatives: exploring the dynamics of the relationship. *J Gen Intern Med*. 2007 Feb;22(2):184-90.
28. Moser RH. Editorial: The continuing search: FDA drug information survey. *JAMA*. 1974 Sep 2;229(10):1336-8.
29. Rutledge P, Crookes D, McKinstry B, Maxwell SR. Do doctors rely on pharmaceutical industry funding to attend conferences and do they perceive that this creates a bias in their drug selection? Results from a questionnaire survey. *Pharmacoepidemiol Drug Saf*. 2003 Dec;12(8):663-7.
30. Chakrabarti A, Fleisher WP, Staley D, Calhoun L. Interactions of staff and residents with pharmaceutical industry: a survey of psychiatric training program policies. *Ann R Coll Physicians Surg Can*. 2002 Dec;35(8 Suppl.):541-6.

**Source of Support:** Nil. **Conflict of Interest:** None Declared.

**Copyright:** © the author(s) and publisher. IJM RP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882.

This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Cite this article as:** Ammar Eid Nahhas, Faisal Eid Nahhas, Saadallah Jaber Alzahrani, Musab Mohammed Anefaie, Abdullah Sameer Basaba, Bassam Awadh Suliman Alhejaili, Faisal Fahad Mohammed Alharth. Pharmaceutical Promotions Impact on Prescribing Behavior of Primary Health Care Physicians: Taif Experience, Saudi Arabia. *Int J Med Res Prof*. 2017; 3(1):20-26. DOI:10.21276/ijmrp.2017.3.1.004