



The survey of physicians satisfaction of implementing “audit and feedback” and “printed educational materials” interventions for rational drug prescribing in cities of Tehran and Mashhad, Iran

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ABSTRACT

Background: Many countries including Iran have used “audit and feedback” (A&F) and “printed educational materials” (PEMs) interventions to improve physicians’ drug prescribing behavior. In addition, several trials have shown low to moderate effects of the two interventions. Nevertheless, few studies have assessed physicians’ satisfactions with A&F or PEM interventions. This is a cross-sectional survey which was carried out in Tehran and Mashhad Cities, Iran, in 2014.

Methods: 181 general physicians, pediatricians and infectious disease specialists working in outpatient practices completed the questionnaire covering demographic characteristics, satisfaction with the A&F and PEM, and the perceived effectiveness of the interventions in improving physicians’ behavior.

Results: Almost all physicians who reported receiving A&F or PEM reports, indicated reading them. In addition, 84% and 86% of the physicians agreed with the efficiency of feedback reports and PEM, respectively.

Conclusion: Findings showed that general physicians study A&F reports more carefully or frequently than the specialists. Physicians believed that revising the feedback report’s format and content could increase its effectiveness.

Keywords: Drug therapy; Educational technology; Physicians; Iran

Citation: Shahriari F, Rashidian A, Soleymani F, Sarayani A, Kebriaeezadeh A. The survey of physicians satisfaction of implementing “audit and feedback” and “printed educational materials” interventions for rational drug prescribing in cities of Tehran and Mashhad, Iran. *J Pharmacoconomics & Pharm Manage* 2016; 2(3-4): 55-9.

1. Introduction

Although medicines are vital elements of medical care, their adverse reactions question excessive and irrational use of drugs in the community. Currently, side effects of non-steroidal anti-inflammatory drugs (NSAIDs), injectable drugs and corticosteroids medications, drug-drug interaction due to polypharmacy, and the resistance to antibiotics are among several adverse outcomes of irrational prescribing and using of drugs in the society. Therefore, a wide variety of interventions and policies have been tested to improve prescription and use of medicines particularly in high-income countries.

World Health Organization (WHO) set up a committee in Nairobi (1985) and proposed a comprehensive definition for rational use of drugs [1]. In line with this definition, WHO suggested 12 strategies comprising of training, management, regulatory, and financial strategies to improve rational use of drugs [2]. As the role of physicians is essential in prescribing drugs, changing their prescribing behavior will be a major

target for interventions to improve rational drug use. Changing prescriber behavior is difficult and may require complex multilayered interventions [3]. Such interventions may include using audit and feedbacks (A&F) as well as dissemination of printed educational materials (PEMs). A&F and PEM have been widely used in health systems as strategies to improve physicians’ prescribing behavior and knowledge.

In Iran, for many years, the problems of irrational drug use have been investigated by academic members of several universities. In 1996, the National Committee of Rational Use of Drugs (NCRUD) was established and a formal process of assessing physician prescribing behavior started in the country. To make this possible, different data sources were developed that included a central data warehouse as well as access to insurance organization prescription datasets. Moreover, different interventions including A&F, dissemination of PEMs, public education, workshops and conferences were employed [4].

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Article information: Received date: 12/08/2015, Accepted date: 20/03/2016, Available online: 14/12/2016

Routinely conducted A&F involves a three-page summary of prescription indicators based on the analysis of insured prescriptions. The summary reports the prescribing indicators for each physician in comparison to their peer groups in the same area in a given time period (annual and quarterly). A&F is sent to the physicians by both insurance company and universities of medical sciences.

These interventions were used for a number of decades; however, studies have shown A&F and PEM have had little or moderate effect on physicians' prescribing behavior [1,5-10]. Viewpoint of the target group physicians about A&F and PEM is of major importance in understanding the outcomes of the aforementioned interventions when implemented in the health systems. Few studies have investigated the physicians' satisfaction with A&F and PEM, and their beliefs about the effectiveness of these interventions.

Therefore, the present study aimed to investigate the rate of Iranians physicians' satisfaction with the A&F and PEM interventions conducted by the Rational Use of Drugs Committee, and Food and Drug Organization in Iran. We also tried to find potential factors to optimize the effectiveness of A&F and PEM interventions from the viewpoint of the target group physicians.

2. Methods

This cross-sectional research was carried out in Tehran and Mashhad Cities, Iran, between January-June 2014. The researcher carried out the study in two cities in order to compare physicians' beliefs in two urban communities. The school of pharmacy's research committee approved the study protocol and the study tool was anonymous. A paper questionnaire was developed by the research team to collect data. It included 23 short answer and multiple choice questions. The respondents were asked to explain the reason for their choice in a number of items. The questions were categorized in three sections:

1. Demographics: The first part of questionnaire comprised of questions regarding information about the demographic characteristics of the physicians including age, gender, education level, and years in practice.

2. Beliefs about A&F: The second part assessed satisfaction with and effectiveness of A&F. The questions were about receiving A&F, the organization which had sent the report, reading the report, motivations to read the report, effectiveness of A&F on prescribing behavior, the way the report was delivered, and the content/warnings mentioned in the report.

3. Beliefs about PEM: The third section assessed satisfaction with and the effectiveness of PEM. The questions were about receiving PEM, reading PEM, motivation for reading PEM, effectiveness of PEM on prescribing behavior, physicians' satisfaction with receiving PEM, and also the PEM content.

Moreover, there was a question concerning the physicians' beliefs about the most effective interventions for improving drug prescribing. Finally, the respondents were asked to express any opinions and issues about rational use of drugs. A sample of PEM and A&F reports was enclosed to the questionnaire to facilitate answering the questions for those who did not receive PEM and A&F reports.

A non-probability convenience sampling method was used, and 200 general physicians, pediatricians and infectious

disease specialists working in outpatient practices were invited to participate. One researcher visited physicians' offices, Medical Council of the Islamic Republic of Iran, and continuing medical education conferences to fill out the study tool.

After data collection, data was transferred to SPSS software (version 22, IBM Corporation, Armonk, NY, USA), and the data entry procedure was double checked. We used descriptive statistics including frequency and mean to analyze the data. Chi-squared test was used to investigate the association of demographic variables and satisfaction or effectiveness domains. Thereafter, the researcher analyzed basic themes in the open-ended question about physicians' beliefs about interventions and opinions about rational use of drugs.

3. Findings

Of 200 distributed questionnaires, 181 were filled: 29 questionnaires from physicians' offices, 59 ones from Medical Council of the Islamic Republic of Iran, and 97 ones from continuing medical education conferences. Of these 181 filled questionnaires, about 106 ones were filled by doctors in Mashhad City and 75 ones in Tehran City; the response rate was 91 percent.

Demographic characteristics: 55.2 percent of the study population (100 participants) was men. The majority of the study sample were general physicians (151 participants), while 30 specialists were included in the study. The average of years in practice was 9.73 ± 10.16 . Participants who aged 40-49 years old, comprised 41.4 percent of study sample. The variable of gender and medical degree, did not significantly influence participants' response to satisfaction and effectiveness items except for "reading the report" item. The mentioned variation will be explained vastly later.

Comparing physicians' viewpoints in Tehran and Mashhad Cities: Results showed that 46.1% (83 persons) of the participants had received the A&F report, of which 57.7% (60 persons) were practicing in Mashhad City, and 30.3% (23 persons) were practicing in Tehran City. Results showed that there is a difference with regards to the organizations that sent out the A&F reports to doctors in Tehran and Mashhad Cities. It was indicated that the universities of medical sciences in Tehran (at least among the selected sample) were less frequently the sender of the A&F report.

Viewpoints of physicians about the most effective interventions for improving rational prescribing were also compared between two cities. 47.4 percent (45 individuals) of physicians in Mashhad and 31 percent (22 people) in Tehran considered A&F as a training intervention which could change prescribing behavior of doctors ($P = 0.03$). However, there was no other significant difference between Mashhad and Tehran Cities regarding the educational interventions.

63 percent of physicians who took part in the research believed that PEM is the best and most effective intervention in this regard. Moreover, 49.7 percent believed that attending training workshops and 13.3 percent believed that applying legal restrictions are the most effective interventions. There were not any significant differences between physicians' beliefs about the preceding items in Tehran and Mashhad Cities.

Regarding PEM items, 16.7 percent of physicians in Tehran and 2.7 percent of those in Mashhad considered senders of PEM as a motivating factor to read the material.

Table 1. Comparing physicians' views in Tehran and Mashhad Cities

Variables	Total (%)	Comparison (%)		P
		Mashhad	Tehran	
Sending of A&F	46.1	57.7	30.3	< 0.0001
Physicians' motivation for reading PEM				
Subject of PEM	48.1	48.0	48.3	0.9600
Content of PEM	58.5	57.3	60.0	0.7500
Highlighted key points	68.1	68.0	68.3	0.9600
Responsible organization	8.9	2.7	16.7	0.0050
The most effective intervention on improving prescribing behavior from physicians' point of view				
Receiving personal A&F report	37.0	47.4	31.0	0.0300
Regulatory restrictions	13.3	15.8	12.7	0.5700
Implementing PEM methods	63.0	69.5	67.6	0.7900
Attending training workshops	49.0	56.4	52.1	0.5800

A&F: Audit and feedback; PEM: Printed educational material

This difference between Tehran and Mashhad Cities is statistically significant; however, other PEM items were similar between the two cities (Table 1).

The following results are reported in the whole study sample because there were no major differences between Tehran and Mashhad physicians.

Assessment of physicians' approaches toward A&F report: Results revealed that 45.9 percent of participants had received the report, of which 98.8 percent had read it. There was no significant difference between men and women who read the report ($P = 0.05$). The proportion of general physicians (71 persons) and specialists (11 persons) who had read the A&F report was significantly different ($P = 0.01$).

The majority of physicians (84.0 percent, 152 persons) believed that A&F can change their prescribing behavior, and 4.4 percent reported that A&F is effective to some extent. In addition, 62.4 percent (113 persons) of physicians stated that the warnings in the report were reasonable. 54.1 percent of physicians (98 persons) mentioned that A&F reports could not clearly explain the performance of physicians. The physicians' beliefs about the content of the report are summarized in table 2. Results indicated that 84.0 percent of the participants wished to see the intensity, type and number of interaction in the report. Moreover, 62.4 percent (113 persons) of physicians preferred tables and graphs in the reports. Only 65.7 percent (119 persons) of physicians were interested in having their work compared with their colleagues. Two physicians stated that the comparisons will be accurate only if "all conditions including geographic status are equal". Only 58.0 percent (105 persons) of the respondents were satisfied with sending the report via post offices.

Physicians' beliefs about effectiveness of A&F: A total of 123 participants expressed their ideas about the effectiveness

of A&F intervention as short sentences. Those who believed that A&F intervention is effective said that "the A&F report will improve physician performance, motivate further studies about drugs information and interaction, and also will lead to prescribing less antibiotics and injections, decreasing drug items, and paying less attention to the patients concerns while prescribing medications.

In addition, physicians stated "evaluating the physicians' performance will optimize their act." Moreover, they believed that "comparing performances of physicians with other colleagues will be helpful but it has shortcomings". They also mentioned that the A&F report should be accompanied by training sessions.

Those physicians who have pessimistic approach toward A&F papers considered that A&F intervention is not effective because rational and evidence-based prescribing of medicines is only a part of writing prescription, but conditions, cognition and culture of the patient are effective on the physician's approach. If the physician ignores this issue, the medical procedure will be at risk or finally the physician will act in line with facilities and requests of the patient. They believed that not only should the physicians' performances be assessed, but also there has to be some intervention such as educational activities on the patients' aspects.

Physicians approaches toward mentioned warnings: 72 physicians expressed their ideas; those who were optimistic about this issue thought that mentioned warnings in the report "will result in more information and will be a reminiscent for doctors and make them review the information again". They said that sometimes physicians make mistakes because of patients' comorbidities, their demand for use of medicines and visiting several doctors. In addition, doctors' busy time and extensiveness of medical sciences are important factors.

Table 2. Prioritization of physicians' point of view on the content of A&F and PEM

Priorities on A&F content	n (%)	Priorities on PEM content	n (%)
Report of intensity, type and number of drug interaction	152 (84.0)	Most common drug interactions	139 (76.8)
Mentioning practice and key point	122 (67.4)	Medical considerations in specific populations	109 (60.2)
Drug prescription costs	95 (52.5)	New drug delivery systems	104 (57.5)
Method of writing:	83 (45.9)	Prescription practice of different drug dosage forms	86 (47.5)
Writing medicine items, dosage and recommendation			
Peer comparison	75 (41.4)		

A&F: Audit and feedback; PEM: Printed educational material

Therefore, they believed warnings will be “beneficial”. Yet, those who had negative approach toward this issue believed that the report includes several shortcomings such as “the report is limited to the two main social health insurance organizations and does not include uninsured prescriptions, so it cannot offer the real performance of physicians”. They also said that a general physician may be practicing in a specific field which requires special drugs, so comparing their performance with other doctors cannot be reasonable. Seasonal variations of diseases are also important in prescribing behavior. They also mentioned that in many cases the patient forces the doctor to prescribe a particular drug. For example, some patients ask the doctor to renew an old prescription written by other physicians. Therefore, inconsistencies may be present among the prescribed drugs, or the number of prescribed medications may seem to be too high, and as a conclusion it might not always be suggestive of the physician’s diagnosis and prescription; and looking at prescriptions alone may not be conclusive.

On the other hand, assessment of the prescriptions without considering the clinical conditions of the patient is inaccurate and irrational, because, in Iran, a patient with several medical problems make the physician to address all of the problems in the same appointment which may be due to high medical costs in Iran. Physicians also objected that culture of people in the region where a doctor works in, has not been considered in the feedback forms. In addition, they pointed out that “the medical personnel may not easily deal with warnings, but they are in favor of training”.

Physicians’ beliefs about method of sending the report: 51 physicians suggested sending the report through internet-based portals in a way that every physician has a password-protected profile, indicating performances. Most physicians were willing to receive the report via email.

Physicians approaches toward PEM: The PEM was sent to 21.5 percent of physicians (39 persons) and 100 percent of them had read it. Besides, 88.6 percent of doctors (140 persons) agreed that the PEM was effective to improve their prescribing behavior (4.4 percent agreed to some extent). 83.2 percent (109 persons) were satisfied with receiving PEM. Physicians’ beliefs about the content of PEM are summarized in table 2. 76.8 percent of them were willing to know about major drug interactions in PEM.

Physicians’ beliefs about effectiveness of PEM: A total of 48 physicians expressed their ideas as short sentences. They believed “training will be effective even if it is too short” and PEM could be a module “to recap on forgotten knowledge and instruct new information”. They also recommended that PEM should contain information about new products and subjects because doctors may be uninformed about cutting edge pharmaceutical and medical information since they are too busy. As the PEMs are summarized information, the doctor will read them with more interest. Physicians were willing to receive PEM consistently and systematically.

4. Discussion

This survey is among few studies that have assessed the views of physicians toward A&F and PEM interventions. Many countries including Iran have used A&F for several years to improve doctor’s prescribing indicators, but this intervention’s

effectiveness could be modest in improving physicians prescribing; however, the results of systematic reviews showed that different factors may optimize A&F effectiveness such as the sense of responsibility by physicians as well as their partnership to specify the contents of A&F [6]. Understanding physicians’ views towards such interventions can help policy makers in identifying ways to increase the effects of the interventions. Our results indicated that when physicians receive A&F report of their performance, they read it eagerly and carefully. In the research done by Shahbalaeei, 98.0 percent of physicians were keen to receive A&F report on their performance [11]. Such findings are encouraging further judicious use of A&F interventions to improve performance. Still, the A&F effects might remain limited, as demonstrated in a recent randomized controlled trial (RCT) conducted in Tehran City [4].

However, our finding from Iranian physicians is different from study conducted by Sondergaard et al., according to which all physicians believed that A&F intervention had no substantial impact on general practitioners’ prescribing practice and most of them did not like to receive A&F report on their performance [12]. Such negative views are also reported in a qualitative study in Iran [4]. Moreover, most of the doctors thought that it is necessary to remove barriers and reform A&F forms in order to optimize its effectiveness. The results also showed physicians expectations for improvements in the content and presentation of the A&F reports. Especially, they complained that the reports did not take into account the variation among the patients presented to different doctors, as different case-mix of patients may warrant different prescribing patterns.

Like previous studies, doctors also believed that the culture of people and their request from doctors are among a set of variables that affect physicians’ behavior, as well as work pressure on the doctors and the level of trust between doctor and patient [13-15]. The way the doctors are paid may also affect prescribing. In Iran, the majority of a practicing doctor’s earning in the private sector is generated via fee-for-service payments. Hence, they may seek to please the patients by responding to their requests for more prescribing, to ensure increased income. Therefore, any policy of improving prescribing behavior should include public awareness and should consider reducing the direct financial links between doctors and patients.

Reviewing views of physicians about PEM in this research showed that doctors are likely to read the PEM if they receive it. The researcher also concludes that most of physicians are keen to receive PEM, and perceive them as useful and potentially effective. Furthermore, doctors seek to receive PEM constantly and systematically. Other studies showed that PEM are more effective when they are sent constantly [16,17]. Although previous studies have shown that PEM is less effective in changing prescribing than other interventions, since they are less costly to conduct they might be a cost-effective option [4,18].

Our study suffered from important limitations as the sample were selected from only two major cities in Iran. Moreover, as we used non-random sampling approaches, the findings may not be generalizable to other populations. Future studies may consider using more representative sampling approaches.

5. Conclusion

Taking physicians' opinions into consideration, the researcher concludes that A&F forms have some shortcomings, for example the reports do not cover all prescriptions of physicians, do not take into account the patients case-mix, and might be limited via comparing physicians with non-comparable peers. Appropriately designed PEMs might be an effective strategy to improve prescribing, and their use should be widened. Policy makers need to take into account other barriers of rational use of medicines if they expect substantial improvements in behavior.

6. Conflict of Interests

Authors have no conflict of interests.

7. Acknowledgments

This research was part of a PhD thesis. The authors would like to thank Dr. Bahrami and his colleagues in Mashhad University of Medical Sciences, and all the physicians who participated in the study. Without their participation this survey would have not been possible to conduct.

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