

Understanding conflicts of interest in rational drug prescription in a developing country: A stakeholder analysis, healthcare guidelines and ethical public health issues

FARIDEH MORADI¹, MOHAMMAD BAZYAR², ALI SOROUSH³, HESAM SEYEDIN⁴, FATEMEH SOLEYMANI⁵,
MANAL ETEMADI^{6,7}, SAEED EZADI⁸, MEHDI SALIMI⁹, MASOUD BEHZADIFAR¹⁰, MARIANO MARTINI¹¹,
REZWANA HUSSAIN¹²

¹ Social Development and Health Promotion Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran; ² Department of Health Management and Economics, Faculty of Health, Ilam University of Medical Sciences, Ilam, Iran; ³ Cardiovascular Research Center, Imam Ali Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran; ⁴ Associate Professor, Department of Health Disaster Management, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran; ⁵ Department of Pharmaco-economics and Pharmaceutical Management, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran; ⁶ The National Institute for Health and Care Research Applied Research Collaboration West (NIHR ARC West) at University Hospitals Bristol and Weston NHS Foundation Trust, UK; ⁷ Population Health Sciences, Bristol Medical School, University of Bristol, UK; ⁸ Department of Health and Social Medicine, Faculty of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran; ⁹ Clinical Research Development Center, Imam Reza Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran; ¹⁰ Social Determinants of Health Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran; ¹¹ Department of Health Sciences, University of Genoa, Genoa, Italy; ¹² Division of Developmental Biology and Medicine, Maternal and Fetal Health Research Centre, St. Mary's Hospital, Faculty of Biology, Medicine and Health, Manchester Academic Health Science Centre, University of Manchester, Manchester, UK

Keywords

Conflicts of interest • Rational drug prescription • Developing country • Stakeholder analysis • Ethical public health issues • Health policy

Summary

Background. Rational drug prescription (RDP) is one of the main components of the healthcare systems. Irrational prescribing can bring about numerous negative consequences for the patients and governmental agencies. This study aims to analyze the involvement of stakeholders in rational drug prescribing, their position (opponent or proponent), and the rationale behind it.

Methods. This was a qualitative study conducted in 2019. Semi-structured face-to-face interviews were conducted with 40 stakeholders. Purposive and snowball sampling techniques with maximum heterogeneity were adopted to select the interviewees. Data was analyzed by MAXQDA software using thematic approach.

Results. Iranian Food and Drug Administration employs the highest authority on the rational prescribing policy. Although the Ministry of Health and Medical Education, the Social Security

Organization as one of the main health insurance organizations, pharmaceutical companies, and the Medical Council of the Islamic Republic of Iran, are among agencies that have great authority to improve rational prescribing, they fail to act professionally as they have conflicting interests. Remarkably, the Iran Food and Drug Administration, insurance organizations, family physicians, and patients, highly support the rational prescribing policy while the pharmaceutical companies display the least support for it.

Conclusions. To make the prescription and using drugs more rational, policy makers should focus on different sources of conflicts of interest that different actors have. They should devise legal, behavior and financial policies accordingly to lessen or at least neutralize these conflicting interests, otherwise achieving RDP would be impossible in short and long terms.

Background

“The irrational use of drugs is a major problem throughout the world. According to the WHO estimations, more than half of all medications are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly” [1-3]. In rational drug prescribing, the appropriate drug should be prescribed for the patient in appropriate doses for an effective treatment period according to the individual's clinical condition. Simultaneously the rational drug prescription (RDP) should also strive to impose the lowest cost possible

on the patient and the community [4]. Altogether, these objectives can be met only if the various steps for drug prescription including the diagnosis of the disease, determining efficient and safe treatment(s), choosing the right drug, dose, and duration of treatment are considered. And to provide the necessary information to the patient and to evaluate the patient's response to the treatment [5]. Irrational drug prescribing can render adverse consequences for the patients and also can lead to patient dissatisfaction, prolonging the duration of treatment, exacerbation of the diseases, severe side effects, hospitalization, as well as undermining the

doctor-patient relationship, and ultimately increasing the treatment costs for the patients in particular and for the government agencies and financial organizations in general [6, 7].

Medications account for 20 to 40 percent of health budgets in many developing countries and 10 to 20 percent in developed countries [8]. One of the issues concerning drug prescription in Iran is non-adherence to the principles of rational drug prescribing. Note that the issue is not particular to Iran, but one of those pertaining to pharmacotherapy worldwide [9]. Studies show that economic factors, *i.e.* the financial association between the physician and the patient, are one of the contributing factors that have exacerbated the irrational prescription of drugs in Iran. Apparently the payment system can affect this relationship which has been proved by other studies in Taiwan and the American states of California and Pennsylvania [6, 10-12]. Payment methods such as fee for service which encourages health care providers to provide more services can also interfere with prescribing drugs rationally. This is the most common payment method in Iran [13].

The financial structure in the Iranian health system and the way of providing health care services have created different sources of conflicting interests which have made it difficult to move towards rational prescription of drugs. The conflicts of interest in the health care system forces actors to behave in favor of their own benefits rather than being faithful to the medical and professional standards such as rational drug prescription [14]. Thus, identifying all related actors interested in prescribing, using, and classifying drugs according to their position (opposing or supporting), and defining their resources mobilized for affective implementation. Importantly, the reasons behind their opposition, supporting or opposing RDP, and identify their potential resistance sources should be understood [15, 16]. This understanding can help health policy makers to advise proper strategies and policies to change the opposing opposition of actors. The present work aims at revealing interests that different actors have in the current chain of drug usage in Iran. The findings may serve in providing policymakers with further insights into rationalizing drug prescribing.

Methods

It is qualitative research that is part of a more extensive work on "Analysis of policies of drug rational prescription and providing policy options for Iran". In our work, we applied stakeholder analysis method for identifying the major policy players and actors of drug rational prescription, and their relationships, position, interest, power sources, and their impact on the implementation of RDP (Tab. I) [17].

Semi-structured interviews were used as the main method to collect the data. We attempted to recognize all the main stakeholders as much as possible and selected stakeholders with the highest variation from various organizations [18]. Different stakeholders, including

Tab. I. Descriptions for defining stakeholders' interest, position, and power.

Interest	The degree of positive or negative influence of policy change on stakeholders, the disadvantages and advantages of the policy implementation for stakeholders or their organization
Position	Stakeholders' understanding regarding the policy and their position about the proposed policy reform: Supporting, opposing or neutral?
Power	Potential resources and capacity, including authority, money, knowledge, political power, <i>etc.</i> for influencing policy decisions

Food and Drug Administration (FDA), Ministry of Health and Medical Education (MoHME), Social Security Organization, Medical Council, Iran Health Insurance Organization, Medical Records Organization, pharmaceutical companies, medical universities, Family physicians and specialists, pharmacists, and patients were chosen for interview. From these stakeholders, key informants with relevant experiences, education, and research in the field, were selected using purposive sampling technique. Another snowball sampling technique was used to identify other stakeholders and informants during the initial interviews. Information was extracted from the interview analysis and document reviews.

In total, 40 face-to-face interviews were conducted, which were continued until no more key stakeholder and informant were specified, and saturation was obtained. The questions were asked depending on the experience of the interviewees, so that the practical and most detailed information could be obtained. At the beginning of each interview, the interview purpose was explained. Confidentiality of the interview content was ensured and anonymity was preserved. Interviews were then taped by two sound recorders. The average length of each interview was 75 min. Meanwhile, while interviews were done, some notes were also taken in addition to the recording.

The transcribed interviews were analyzed and indexed using two researchers. For this purpose, thematic analysis was used by MAXQDA12 software. The following items were used for assessing information concerning the actors' influence and interest both ranging from high to low as well as their positions (supporting, opposing, or neutral) (Tab. III): responses of interviewees on their status and roles of the other stakeholders; the quality of reactions of actors appeared in reports, analysis of relevant documents, and finally the judgment and interpretation of authors.

Results

In this study, the main agencies of rational drug prescription were analyzed. The agencies included the Ministry of Health and Medical Education, the Iran Food and Drug Administration, health insurance organizations (the Iran Health Insurance Organization and the Social

Tab. II. List of key stakeholders and their roles in rational drug prescribing.

No.	Organization	Involvement
1	Ministry of Health and Medical Education	Responsible for policymaking, preparing clinical guidelines including guidelines to manage the prescription of drugs (expensive drugs, drugs with high consumption etc.), health care provision, and supervision in the health system including drug section
2	Food and Drug Administration	The chief policymaker in devising, implementing, and supervising the application of rational drug prescribing policies
3	Health insurance organizations	Policymaking, setting basic benefit packages including drugs to be covered for patients, Preparing a list of covered drugs, paying for drugs under coverage, Responsible for strategic purchasing in the health system Supervising physicians' prescriptions and Adopting legislations in this respect
4	Pharmaceutical companies	Producing adequate, high-quality and affordable drugs
5	Family physicians	Treating patients and prescribing drugs which are under coverage of Family Physician Program
6	Specialists	Treating patients and prescribing drugs
7	Medical Council	Devising rational drug prescribing policies and preparing clinical guidelines
8	Pharmacists	Delivering drugs to patients, Interacting with physicians and providing valid information to prevent drug interactions, Educating patients about the correct application of drugs
9	Patients	Using and paying for drugs

Tab. III. The interest, positions and influences of key stakeholders of rational drug prescription in Iran.

	Organization	Interests ^a	Positions ^b	Influences ^c
1	Ministry of Health and Medical Education	High	Moderate Support	Moderate
2	Food and Drug Administration	High	High support	High
3	Insurance organizations	High	High support	Moderate
4	Pharmaceutical companies	High	Low support	High
5	Family physicians	Low	High support	Low
6	Specialists	High	Moderate Support	Low
7	Medical Council	High	Moderate Support	Moderate
8	Pharmacists	Moderate	Moderate Support	Low
9	Patients	High	High support	Low

^a Degree to which stakeholders likely to be affected by policy change; ^b Understanding of stakeholders about the policy issue and their position regarding the proposed policy reform: support, oppose, or neutral?; ^c Potential capacity and resources including money, authority, political power, and knowledge to influence policy decisions.

Security Organization), pharmaceutical corporations, family physicians and specialists, pharmacists, the Medical Council of the Islamic Republic of Iran, and patients. The role, power, position and conflict of interests that each of these actors has regarding prescribing drugs rationally, would be explained in detail as follows.

The involvement and role of key stakeholders of rational drug prescribing in Iran.

Before addressing each stakeholder individually, the roles that each actor has regarding the prescribing drugs rationally in Iran have been provided in Table II. This helps understanding the power, position and conflict of interests of actors better.

MINISTRY OF HEALTH AND MEDICAL EDUCATION

According to the Iranian constitution, the MoHME is responsible for policymaking, health service provision, and supervising the quality of health services and the performance of health care providers in the health sector. The MoHME is also responsible for medical education and training health workforces in different fields. MoHME legally has the authority to implement policies

and arrangements for the rational prescription of drugs in Iran. However, some interviewees believe that the conflicts of interest within the MoHME prevent it from exercising this authority in this regard, as M6 says, *“One of the issues we have in the country is that the positions are not clear. Conflict of interests is integrated in the MoHME as it devises and implements policies produce medicine, sell them, and buy them at the same time. When all of these conflicting duties gather together, conflict of interests would be unavoidable”*.

IRAN FOOD AND DRUG ADMINISTRATION

The Secretariat of the National Committee for Rational Prescribing of Drugs is established within the Iran Food and Drug Administration. The committee comprises of members actively involved in the development of drug policies. The headquarters of Iran Food and Drug Administration is located within the MoHME. One of nine deputies of Medical Universities is Food and Drug Administration which work as its provincial branches. Committees exist within medical schools nationwide, which happen to be similar to the national committee

with the very structure. *“We stated in the bylaws of the national committee that the medical universities should also have a committee for rational prescribing of drugs, and the university deputies of medical universities should attend in the committee. The representative of the health insurance schemes and the provincial medical council, four specialist including internal medicine, gynecology, surgery, pediatrics, and one pharmacist should also be present in the committee”* said M10.

HEALTH INSURANCE ORGANIZATIONS

Health insurance organizations have a legal authority in terms of rational drug prescribing and usually can use this power to force physicians to consider principles of rational drug prescriptions. They can cancel their contract with the health care providers or avoid reimbursing the drugs, which have not been prescribed rationally. Arguably, insurance organizations hold a significant authority in rational drug prescribing. *“Our physician training is not protocol-based so that we could prepare protocols [for rational drug prescribing]. The only place where the protocols seem to work is through the force of Social Security Organization and IHIO, which says ‘I won’t pay your due (if you don’t practice according to the rational drug prescription), you have to prescribe drugs this way,”* said M6.

One of the reasons that prevent policymakers from efficiently exercising their authority to prescribe drug rationally is the conflict of interests. One of the interviewees believed that a lack of transparency in the mission statement as an influential factor. That is, an individual’s rank within the system is relevant here.

M13 says, *“There are inconsistencies in the health system have made it a bit difficult to control irrational drug prescription. If you are going to sell and supervise the sales of something (drug) yourself, supervision will definitely become an issue. On the one hand, the Social Security Organization says ‘I have to sell my drugs because 60% of drugs in the country are produced by me; on the other hand, it says that physicians should not prescribe too much drug for patients”*

PHARMACEUTICAL COMPANIES

The mission of pharmaceutical companies is to cure patients mainly by producing adequate, high-quality, and affordable drugs. Many of the interviewees stated that the role of pharmaceutical companies has been now more commercialized as their main concern is to focus on earning more profits despite their organizational mission and commitment.

“The profit of pharmaceutical companies is in selling more and they don’t care much about the health of people. To be honest, I am working in a pharmaceutical company too, but companies prefer to sell the drugs and their sales are important. Pharmaceutical companies are not so concerned about it (rational drug prescription)” said M26. According to some of the interviewees, making some wrong policies in the Ministry of Health and Medical Education has caused many pharmaceutical companies to deviate from their main commitments and to focus on their sale market instead.

“What have the times brought on? When the Ministry of Health says that price of the drug x should not exceed 100 Tomans for the consumer, and at the same time the company allege that producing this drug cost the least 120 Tomans. Instead, MoHME asks pharmaceutical companies ‘earn your profit from selling other drugs.’ Pharmaceutical companies should be able to gain their profits from every drug they produce” mentioned M8.

FAMILY PHYSICIANS

The family physician program was implemented in rural areas of Iran in 2003 to reduce inequalities in using health care services, to enhance universal health coverage and to promote social justice. This program has been influential in improving the health status of population, particularly in rural and urban areas with populations of fewer than 20,000 individuals. According to the most of interviewees there is no financial relationship between family physicians and patients. FPs are paid a fixed amount of money monthly (per capita) regardless of the number of people they treat, health care services they provide or the amount of drugs they prescribe. Because of these reasons, interviewees believed that FP program can help to follow and achieve the goals of rational drug prescription. Prescribing more drugs for patients does not lead to more financial resources for the FPs. In other words, physician’s lack of dependence on patient satisfaction for income leads to rational drug prescription. *“Other family physicians and I who work in the clinic do not care much about the financial aspects at all because we receive a fixed salary”* M27 said.

SPECIALIST DOCTORS

According to many interviewees, physicians logically agree with rational drug prescription to treat patients. Some financial and cultural considerations force them to take into account irrational requests of patients for prescribing drugs in order to maintain patient’s satisfaction and keep the flow of patients in the long run, which normally will lead to irrational drug prescribing. *“In practice, we all like to prescribe drugs rationally, but as we work [as professionals], we have to prescribe drugs in a way to satisfy the patients as well. Generally speaking, the physicians support rational drug prescribing but some irrational prescribing goes for the sake of keeping patients”* M15 mentioned.

MEDICAL COUNCIL OF THE ISLAMIC REPUBLIC OF IRAN

Medical Council of the Islamic Republic of Iran is an independent and union organization that advocates for doctors and patient rights, respectively. The role of Medical Council in rational drug prescribing is mainly consultative by participating and giving advice in the relevant meetings and committees. As the Secretariat for Rational Drug Prescribing is located within the Food and Drug Administration, the role of the Medical Council of the Islamic Republic of Iran and Hospital Affairs Deputy of MoHME concerning rational drug prescribing is not considerable in practice. *“The role*

of Medical Council is negligible now, although the Medical Council is responsible for implementing the law of medical council. The Medical Council could play a more influential and serious role in improving rational drug prescription but I believe this is mostly because the rational drug prescribing secretariat is not within the Medical Council” says M4.

The target population of Medical Council is medical doctors. They have a high legitimacy in the society and enjoy strong lobby and power in the MoHME. Because of that, even Medical Council cannot force them to work within some restrictive frameworks or impose some policies which may restrict their autonomy and practice. “The Medical Council has yet to persuade doctors that if you want to see a patient, you must write your prescription electronically, not on a piece of on paper just like that” said M4.

The main duties of pharmacists are provision of drug consultation for the patients. Financial issues and payment methods can create a situation which may impede pharmacists to consider principles of rational drug prescription. At times, emerging circumstances such as lack of economic recognition and support from policymakers combined with the absence of legislation in this regard lead to conflicts of interest that alter the professional and ethical commitments of pharmacists and jeopardize the interests of patients. Regarding this concern, one interviewee said that: “But there are several economic concerns (which may hinder pharmacists moving towards rational prescribing). For instance, a pharmacist can prevent many [of unnecessary drug consumption] uses, but why a pharmacist should do that? Who would pay pharmacists if they reduce the consumption of a drug? How about the financial incentives when it comes to selling drugs? There are drugs that if I were to instruct you on how to take them, it would take at least half an hour. Well, who reimburse me for that? Why physicians are paid for their visits and consultations but not the pharmacists? What do you pay for when doctors examine you? For their time and knowledge, right? Why don't you pay the pharmacists for these?” M8 said.

Pharmacists have a critical role in the clinical process of patients in the health system. The pharmacists can accelerate the process of treatment of patients and help treating physicians to cure patients effectively by supervising pharmaceutical procedures and proposing the best pharmaceutical recommendations which can result in rational prescription. This requires a close and interactive relationship between physicians and pharmacists. Interviewees believed that currently this kind of relationship does not exist between them in Iran. “The problem is that the relationship between doctors and pharmacists are not strong enough” M15 said.

Pharmacists can influence rational drug prescription differently depending on whether they own pharmacy and get bonus for selling more drugs. Hence, it can be said that their impact on rational prescription is moderate. “Generally, the position of pharmacists regarding the rational drug prescribing is not favorable; they are not

really interested in rational prescribing. Remember that it depends on whether they are the owner of the pharmacy or not. Pharmacists who work as technical officers for the owners of pharmacies do not have a share in the pharmacy's profit and do not care much about the drug sales. I (as a technical officer) sign a contract and receive a fixed payment monthly. Pharmacy owners are obliged to pay my monthly salary regardless of the amount of pharmacy's sales” M 23 said.

Collusion among a small portion of physicians and pharmacies is undeniable and some of physicians refer their patients to some specific pharmacy to get their drugs. Sometimes, this collusion occurs between pharmaceutical companies, doctors and pharmacies. These companies attempt to increase their sales by suggestion of paying commissions to physicians and pharmacies to sell their drugs, an act that leads to increasing the health care expenditures for health insurance companies, the whole health system, and patients, and ultimately imperils the health of community. “Sometimes we see pharmacists colluding with pharmaceutical companies or even doctors by paying commission to prescribe their proposed drugs or sending patients to their pharmacies” said M25.

PATIENTS

Rational drug prescription or prescribing proper drugs for the patients considering their socioeconomic status and medical condition by the doctor will cure the diseases in the shortest period of time with imposing the least amount of cost possible on patients and the health system and simultaneously will lead to patient satisfaction as well as reduce adverse drug reactions and negative side effects among patients.

“Of course we all like to receive affordable prescriptions that will cure us soon enough once we refer to a doctor,” M40 agreed.

Table III indicates that the family physicians receive the least impact from the rational drug prescribing program unlike other stakeholders, as family doctors receive a certain monthly salary with no financial relationship between the patient and the doctor and prescribing more medications to will not render more income for the doctor. According to this table, the Iran Food and Drug Administration, insurance organizations, family physicians and patients display the highest support for rational drug prescribing policy while pharmaceutical companies display the least support for this issue.

The Iran Food and Drug Administration exerts the highest impact on this policy, while the Ministry of Health, insurance companies, and the Medical Council of the Islamic Republic of Iran also hold a high authority in this regard, but do not act efficiently due to conflicts of interests.

Discussion

The Iran Food and Drug Administration was the chief stakeholder of Iran's rational drug prescription policies

and programs. The responsibility for rational drug prescription must be put in the hands of the Ministry of Health, and all other actors within the health system, including health insurance schemes should work in line with MoHME' policies. Various legal solutions have been envisioned for the efficacy of medical expenses, but collaboration and empathy of all healthcare system components are needed to fulfill the aims and render optimal use of resources at the end. Due to establishment of the Secretariat of the National Committee for Rational Prescribing of Drugs in the FDA, the main duties regarding the RDP are expected from this organization and the role of other actors including the Deputy of Treatment and Education of Ministry of Health is limited to attend in the meetings despite their potential capacity for playing a greater role. The MoHME as the main actor for making health policies and responsible for health governance, is expected to act more strongly and force other deputies and influential actors to collaborate with FDA more closely for rational prescribing of drugs. Meanwhile, international health studies and reports, including documents published by the World Health Organization indicate that health promotion interventions requires coordinated efforts by all relevant individuals and institutions from outside and inside of health system, including public and private actors, NGOs, industries, and the media [19].

Improving rational drug prescribing programs in Iran needs the strengthening of the stewardship function of the MoHME by reorganizing its structure and responsibilities. As seen in the healthcare systems of developed countries such as Germany and Japan, the responsibilities of the Ministry of Health must be limited to supervision, monitoring of the quality and standards of healthcare services, and regulating the relations between various actors and institutions within the healthcare system, even those with conflicting interests including health insurance schemes and pharmaceutical companies [20].

The next influential stakeholder affecting the RDP in Iran was health insurance organizations. Health insurance organizations review the drug prescription behavior of both general and specialist physicians and send their prescription behavior profile to them as one of the main effective health expenditures control mechanisms. These feedbacks can help physicians to be aware of their prescription behavior and compare their practice with the average prescription in the country and their peers with the same specialist. By following more rational drug prescription behaviors, this can lead to improving the quality of health care services, accelerating recovering from diseases sooner, reducing side effects of irrational drug prescription, and reducing unnecessary costs for patient and community costs.

Health insurance companies are the main financier in the health system and are the main payer to reimburse the costs of prescribed drugs. Health insurance experts review the medical claims of hospitals and do not cover drugs which have not been prescribed rationally. As a result, health insurance organizations could

reshape the behavior of physicians and rationalize their prescription, and move towards optimizing drug expenditures. According to the findings of the current study, the health insurance organizations have failed to use their potential power and authority effectively and efficiently to step forward making drug prescription more rational despite having control on financial resources as one of the major levers to reform health system and modify the behavior of physicians. A study by Sinot's designated that health insurance companies can impact the prescribing behavior of physicians and reduce their prescriptions [16].

Doctors are among the most powerful stakeholders in the country who can affect the rational drug prescribing policies and programs directly. Accordingly, doctors can be separated into specialists and general practitioners. Specialist physicians and a group of general practitioners working in the private sector may have to not to consider the principles of rational drug prescription strictly, because patients' satisfaction is affected by the number of drugs that doctors prescribe in a single prescription or the patients may insist on prescribing some specific drugs which may not appropriate for them. Doctors know that "money follows the patient in the private sector" means that they oblige to violate the principles of rational drug prescription as they have to make their patients satisfied if they want to have a constant flow of patients and money in the long run. When a patient refers to a pharmacy, the pharmacists usually are forced to prescribe medication based on what the patients believe is appropriate for them which can lead to irrational drug prescribing [18]. In many developing countries, antibiotics are often prescribed irrationally. For instance, hospital-based studies show that more than half of the treated patients receive antibiotics [19].

In the current health system in Iran, a patient may visit several specialists in a day to treat a particular disease as they can go to different specialists without limitation (family physician and following referral system is implemented in rural areas and at the moment, although it still suffers from many operational challenges and the regulations are often being violated by patients and family physicians). The same drugs may be prescribed by different physicians for the patients and they may also contradict and usually there is no checking the history of drugs prescribed by other physicians or drugs that patients may use currently. So there is no efficient and effective system to supervise or monitor the health care services and drugs prescribed by the providers at the time of prescription. This lack of integration causes many problems in the health system, for instance there is no adequate control over the health centers and patients regarding drugs they get which leads to a substantial waste of financial resources of the government and health insurance organizations and at the same time will increase the out-of-pocket expenditures of patients. The lack of controlling mechanisms creates a situation in which a part of providers and pharmacists prescribe extra drugs irrationally for the patients in order to gain more money.

In 2021, an online electronic system was introduced for prescribing and dispensing drugs and the physicians were obliged to use this new system for prescription. As many clinical rules have been embedded in the electronic system, most of common medication errors, irrational prescriptions and common contradictory medication prescription would be eliminated. This can lead to improving rational prescription by warning doctors not to prescribe some specific drugs for patients with specific conditions and warning physicians whenever a common wrong prescription or contradiction is happening. So besides rational drug prescription, electronic prescription system increases staff productivity and improves accuracy in providing medical services such as drug prescription by physicians, and saving financial resources. Another reform implemented by the IHIO in August 2019 was introduction of a new online system for reviewing claims. This online intelligent system can also help health insurance organizations to move towards automatic implementation of rational prescriptions. For instance, this system warns and informs the health insurance experts when number of drugs prescribed for the patients violates the predetermined limits. This also informs physicians and nurses to be aware of rational prescriptions principles entered in the system. Similar systems are being established in other basic health insurance organizations.

The second group of stakeholders includes physicians serving within the government system as rural family physicians. Arguably, the rural family physicians prescribe drugs more rationally given that they receive a certain monthly salary from the system, their income does not depend on patients, and are now required not to prescribe more than a certain average of drugs in each prescription. It's worth mentioning that some experts believe that the restricted number of drugs that family physicians are allowed to prescribe for patients sometimes contradict with the rational prescription principles because seasonal illnesses, the rise of regional diseases, *etc.* do not seem to be reflected in FP' guideline. In fact, regional needs and diseases, as well as the patient's circumstances affect the items prescribed by the physician and no particular number or amount could be predetermined.

Recently the Office for Health Technology Assessment, Health Standards and Tariffs of MoHME in cooperation with specialized clinical groups has focused on developing clinical guidelines for medications, health services and diagnosis examinations which can lead to rational prescription and using health services. Guidelines recommend the most reliable clinical path for health provision but currently there are no reliable mechanisms to implement all guidelines which have been developed until now. It is health insurance experts who have financial incentives in some cases to use these guidelines not to reimburse drugs not prescribed according to the guidelines standards.

Incentive payment to physicians funded by the savings made via rational drug prescribing and taxing physicians based on their income can be efficient strategies for

rationalizing drug prescribing. In the end, laws are needed to render accountability and efficiency for relevant organizations concerning their particular commitments to actualize rational drug prescribing in addition to the necessity for a solid authority to devise and enforce macro policies. Successful implementation of mandatory policies can help reduce disadvantages and improve prevailing strengths.

The most convenient strategy to attain RDP is to implement a rural insurance program in the form of a family physician referral system. The approval of Article 91 in the Fourth Economic, Social, and Cultural Development Plan of the Islamic Republic of Iran is also an emphasis on the establishment of healthcare insurance with a focus on family physicians and the referral system. In the family physician program and referral system, the general practitioner and his or her team are fully responsible for the well-being of the individuals and families under their care and remain so for the follow-up of the patient's aftermath once the patient has been referred to the specialized levels. Accordingly, one of the most crucial duties of a family physician is to provide primary healthcare assistance and services, without which the application of the "family physician" term is inappropriate to imply a mere provision of medical services. Furthermore, all healthcare services included in the family physician program are actively provided to the population under care.

Another major strategy in attaining RDP is the use of media, including the Islamic Republic of Iran Broadcasting (IRIB) organizations. Media play an important role in promotion of RDP by broadcasting informative programs regarding the necessity of following rational prescription. IRIB media draws the attention of health policymakers and individuals within society towards the irrational drug prescribing issue and its consequences. Therefore, health policymakers must establish an close and strong relationship with the media and influence the content and form of the information conveyed via media outlets [21-23].

Conclusions

Conflict of interest in some influential organizations, including the Ministry of Health, Medical Council of the Islamic Republic of Iran, and the Social Security Organization, have caused these organizations not to exercise their potential authority and means to move towards RDP as efficiently as expected. The Ministry of Health is obliged to implement a strategic and comprehensive program for the RDP in the country and establish adequate collaboration and harmony with all health stakeholders through participation. Improving the state of drug prescribing in the country necessitates the implementation of multi-sectoral policies with the participation of all organizations and stakeholders involved in this regard. The effective response to this issue also demands the political commitment of policymakers, high-ranking officials and the healthcare system.

Ethical aspects

Ethical approval was obtained from the Kermanshah University of Medical Sciences (IR.IUMS.REC.1397.1060).

Acknowledgments

This study was supported by Kermanshah University of Medical Sciences.

The researchers would like to thank the Clinical Research Development Unit of the Educational Treatment Center of Imam Reza (PBUH). We are also thankful to those who participated in our study and agreed to put their precious time to interview and enrich our data by their valuable statements.

Conflict of interest statement

The authors declare no conflicts of interest.

Authors' contributions

FM, HS, and FS participate in conception or design of the work. FM collected the data. FM, MB, AS, ME, SE, MS, RH, MB, MM participated in data analysis and interpretation, drafting the article. FM, MB, ME, and RH contributed in critical revision of the article. All named authors approved the final approval of the version to be submitted.

Consent for publication

Not applicable.

Availability of data and materials

All transcriptions and data generated during the current study are in Persian and not publicly available as it is not allowed by the Ethics Committee, but would be available from the corresponding author on reasonable request.

References

- Dong L, Yan H, Wang D. Drug prescribing indicators in village health clinics across 10 provinces of Western China. *Fam Pract* 2011;28:63-7. <https://doi.org/10.1093/fampra/cm077>
- Calikoglu EO, Koycegiz E, Kosan Z, Aras A. Rational drug use and prescribing behavior of family physicians in Erzurum, Turkey. *Niger J Clin Pract* 2019;22:626-32. https://doi.org/10.4103/njcp.njcp_258_18
- Mamo DB, Alemu BK. Rational drug-use evaluation based on World Health Organization core drug-use indicators in a tertiary referral hospital, Northeast Ethiopia: a cross-sectional study. *Drug Healthc Patient Saf* 2020;12:15-21. <https://doi.org/10.2147/DHPS.S237021>
- Dessie B, Atalaye G, Direess E, Getahun A. Practice towards rational drug use at Finotselam and Asirade Zewudie hospitals based on WHO core drug use indicators, Northwest Ethiopia. *ScientificWorldJournal* 2020;2020:1634294. <https://doi.org/10.1155/2020/1634294>
- Ahmed SM, Islam QS. Availability and rational use of drugs in primary healthcare facilities following the national drug policy of 1982: is Bangladesh on right track? *J Health Popul Nutr* 2012;30:99-108. <https://doi.org/10.3329/jhpn.v30i1.11289>
- Haghighatpanah M, Hunga G, Jha T, Mallayasamy S. Study on prescribing pattern of anti-diabetic drugs among type 2 diabetes patients with complication in South Indian teaching hospital. *Asian J Pharm Clin Res* 2016;9:194-7.
- Jin G, Chen C, Liu Y, Zhao Y, Chen L, Du J, Lu X, Chen J. Prescribing patterns of encounters in fourteen general practice clinics in rural Beijing: a cross-sectional study. *BMC Health Serv Res* 2019;19:807. <https://doi.org/10.1186/s12913-019-4656-2>
- Raveh D, Levy Y, Schlesinger Y, Greenberg A, Rudensky B, Yinon AM. Longitudinal surveillance of antibiotic use in the hospital. *QJM* 2001;94:141-52. <https://doi.org/10.1093/qjmed/94.3.141>
- Bae EY, Lee EK. Pharmacoeconomic guidelines and their implementation in the positive list system in South Korea. *Value Health* 2009;12(Suppl 3):S36-41. <https://doi.org/10.1111/j.1524-4733.2009.00625.x>
- Hakoum MB, Anouti S, Al-Gibbawi M, Abou-Jaoude EA, Hasbani DJ, Lopes LC, Agarwal A, Guyatt G, Akl EA. Reporting of financial and non-financial conflicts of interest by authors of systematic reviews: a methodological survey. *BMJ Open* 2016;6:E011997. <https://doi.org/10.1136/bmjopen-2016-011997>
- Hill JC, Kang S, Benedetto E, Myers H, Blackburn S, Smith S, Dunn KM, Hay E, Rees J, Beard D, Glyn-Jones S, Barker K, Ellis B, Fitzpatrick R, Price A. Development and initial cohort validation of the Arthritis Research UK Musculoskeletal Health Questionnaire (MSK-HQ) for use across musculoskeletal care pathways. *BMJ Open* 2016;6:E012331. <https://doi.org/10.1136/bmjopen-2016-012331>
- Stuckler D, Basu S, McKee M. Global health philanthropy and institutional relationships: how should conflicts of interest be addressed? *PLoS Med* 2011;8:E1001020. <https://doi.org/10.1371/journal.pmed.1001020>
- McCrary SV, Anderson CB, Jakovljevic J, Khan T, McCullough LB, Wray NP, Brody BA. A national survey of policies on disclosure of conflicts of interest in biomedical research. *N Engl J Med* 2000;343:1621-6. <https://doi.org/10.1056/NEJM200011303432207>
- Frolic A, Chidwick P. A pilot qualitative study of "conflicts of interests and/or conflicting interests" among Canadian bioethicists. Part 1: five cases, experiences and lessons learned. *HEC Forum* 2010;22:5-17. <https://doi.org/10.1007/s10730-010-9124-7>
- Kilic B, Kalaca S, Unal B, Phillimore P, Zaman S. Health policy analysis for prevention and control of cardiovascular diseases and diabetes mellitus in Turkey. *Int J Public Health* 2015;60 (Suppl 1):S47-53. <https://doi.org/10.1007/s00038-014-0557-7>
- Sinnott SJ, Buckley C, O'Riordan D, Bradley C, Whelton H. The effect of copayments for prescriptions on adherence to prescription medicines in publicly insured populations: a systematic review and meta-analysis. *PLoS One* 2013;8:E64914. <https://doi.org/10.1371/journal.pone.0064914>
- Bazyar M, Rashidian A, Sakha MA, Doshmangir L, Rahimi N, Ranjbar M, Sagha Abolfazl SF, Tabatabaei Lotfi SM, Olyaeemanesh A. Stakeholders analysis of merging social health insurance funds in Iran: what kind of interests they may gain or lose? *Int J Health Plann Manage* 2019;34:157-76. <https://doi.org/10.1002/hpm.2605>
- Joudaki H, Rashidian A, Minaei-Bidgoli B, Mahmoodi M, Geraili B, Nasiri M, Arab M. Improving fraud and abuse detection in general physician claims: a data mining study. *Int J Health Policy Manag* 2015;5:165-72. <https://doi.org/10.15171/ijhpm.2015.196>

- [19] Adebayo ET, Hussain NA. Pattern of prescription drug use in Nigerian army hospitals. *Ann Afr Med* 2010;9:152-8. <https://doi.org/10.4103/1596-3519.68366>
- [20] Ikegami N, Campbell JC. Health care reform in Japan: the virtues of muddling through. *Health Aff (Millwood)* 1999;18:56-75. <https://doi.org/10.1377/hlthaff.18.3.56>
- [21] Wroe J. How can the media be best used to influence the diabetes policy makers? *Pract Diabetes Int* 2006;23:178-82. <https://doi.org/10.1002/pdi.939>
- [22] Rosselli R, Martini M; Fluad Effect Working Group; Bragazzi NL, Watah A. The public health impact of the so-called “fluad effect” on the 2014/2015 influenza vaccination campaign in Italy: ethical implications for health-care workers and health communication practitioners. *Adv Exp Med Biol* 2017;973:125-34. https://doi.org/10.1007/5584_2017_39
- [23] Orsini D, Bianucci R, Galassi FM, Lippi D, Martini M. Vaccine hesitancy, misinformation in the era of COVID-19: lessons from the past. *Ethics Med Public Health* 2022;24:100812. <https://doi.org/10.1016/j.jemep.2022.100812>

Received on July 18, 2023. Accepted on July 27, 2023.

Correspondence: Mohammad Bazyar, Department of Health Management and Economics, Faculty of Health, Ilam University of Medical Sciences, Ilam (Iran). Tel.: +9809187420480. E-mail: bazyar.mohamad@gmail.com

How to cite this article: Moradi F, Bazyar M, Soroush A, Seyedin H, Soleymani F, Etemadi M, Ezadi S, Salimi M, Behzadifar M, Martini M, Hussain R. Understanding conflicts of interest in rational drug prescription in a developing country: A stakeholder analysis, healthcare guidelines and ethical public health issues. *J Prev Med Hyg* 2023;64:E358-E366. <https://doi.org/10.15167/2421-4248/jpmh2023.64.3.3036>

© Copyright by Pacini Editore Srl, Pisa, Italy

This is an open access article distributed in accordance with the CC-BY-NC-ND (Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International) license. The article can be used by giving appropriate credit and mentioning the license, but only for non-commercial purposes and only in the original version. For further information: <https://creativecommons.org/licenses/by-nc-nd/4.0/deed.en>