

Bibliographic Search of Publication Patterns in Rational Use of Drugs in Iran: A Systematic Approach

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Abstract- Inappropriate use of drugs is a widespread problem with serious consequences such as increased adverse drug reaction and antimicrobial resistance. Proper interventions would have important financial and public health benefits. Several studies have been performed about Rational Drug Use (RUD) in Iran. To provide a picture of researches were done about RUD and highlight the existing gaps in practice in Iran, a systematic search was conducted by reviewing all papers (English and Persian) found by searching keywords in Pubmed, Web of Science, Google Scholar, CINAHL, Proquest, International Pharmaceutical Abstract (IPA), SID, Iran Medex and MagIran. Retrieved articles were extracted in Access form and exported to Excel for further analysis. After excluding duplicate and irrelevant articles, 466 related articles were remained. Number of publications increased dramatically after 2001. About 73% of studies were cross-sectional. Evaluation of prescribing pattern (15%), self-medication (11.3%) and adverse drug reaction (9.1%) were among the top topics which were studied. Despite an increasing trend in RUD publications in Iran, still large gaps remain to be investigated. Knowing the existing gaps is crucial for policy makers to make investments to solve the problems.

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Introduction

Rational use of medicines require appropriate use of drugs based on their clinical needs, in doses that meet their requirements, for an adequate period of time and at the lowest possible cost for patients and their community (1). Inappropriate, ineffective and economically inefficient use of drug is a global problem that commonly observed in health care systems especially in developing countries (2,3). Unfortunately, medicines use is not routinely monitored in many countries and only comes to the attention by health decision-makers when there is an acute shortfall in the health budget. There is evidence suggesting that more than half of all medicines are not used in an appropriate way (4).

Lack of information, inadequate training and

education of medical graduates, poor communication between health professionals and patients, uncertainty of diagnosis, demand from the patient, defective drug supply system and promotional activities of pharmaceutical industries are some of the reasons for irrational use of drugs (5-8). These may lead to increased and unsafe treatment, increased adverse drug events, acceleration rates of antimicrobial resistance and higher cost of treatment (9).

Since the 1976 revolution, Iran has adopted a full generic-based National Drug Policy (NDP), with local production of essential drugs and vaccines as one of the main goal. Even though, about 95% of drugs (in term of volume) on the market in Iran have been produced by close the 70 pharmaceutical companies, but still 33.6% of drug budget have been allocated to the imported items and only 66.4% to the local manufacture (based on

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statistics in 2008)(10). About 4200 medicines including chemical, herbal and biological dosage forms covering over 2400 drug entities on the National Drug List (NDL) have been registered and granted marketing authorization. It should be mentioned that only medicines with prior approved by the National Drug Selection Council (NDSC) can be registered. All items which have been approved by NDSC are listed and published annually as NDL.

The Ministry of health has established a center for promoting Rational Use of Drugs (RUD) in 1995. This center collected data through a unique prescribing auditing system, disseminating drug and poison information and the Adverse Drug Reaction Centers. During 10 years (1998-2007) period, data from close to 100 million prescriptions were collected and analyzed. The mean item of drugs per prescriptions was 4.25 and 3.28 in 1998 and 2007 respectively. Nearly 49% of prescriptions had included antimicrobials and 42% included the injectable drugs. About 23% of prescriptions had included Corticosteroids (in 2007). The trends show that during 10 years period, the prescription indicators were decreased but still higher than other countries (11).

However, in other developing countries, the reports of medicines use have suggested that the prescribing patterns have not improved consistently over time (1982-2006) (12).

The first step to improve the current situation is to measure existing practice (13) which forms the basis of

advocacy for change. Although several studies were performed in this field in Iran but there were inconclusive and raise many questions about the focus of the studies, design, setting and other details.

Therefore we decided to undertake a systematic search of all studies published about RUD and medicine use in Iran which have been published to date, in attempt to provide a picture of works were done in this area and found existing gaps for future studies.

Materials and Methods

In order to provide enough databases about the subject, we did a systematic search utilizing both English and Persian electronic database. Pubmed, Web of Science, International Pharmaceutical Abstracts (IPA), CINAHL, Proquest and Google Scholar were searched by listed English keywords (Appendix 1). We also searched Persian electronic database included: Iran doc, Mag Iran, Iran Medex and SID by the Persian equivalents of selected English keywords.

Keywords included terms describing and covering all fields in rational use of drugs. Search terms were mapped on to MeSH terms in Pubmed. And the formal search strategy is summarized in diagram 1. All keywords were combined with "Iran" and all database searched without narrowing or limiting search elements to find the most relevant literatures about the subject (Appendix 1).

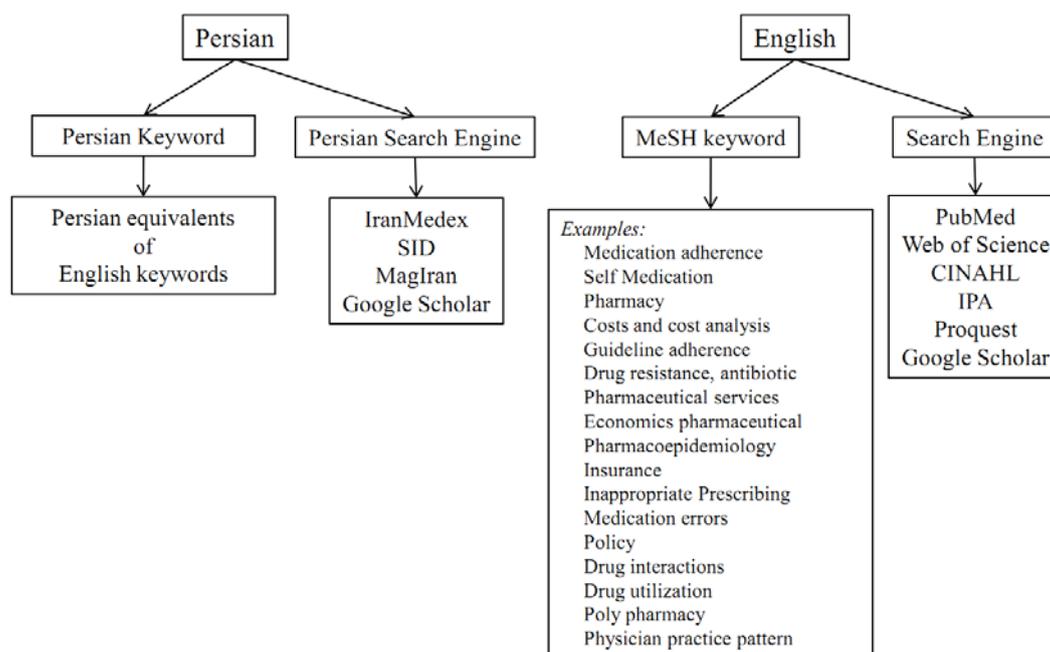


Diagram 1. Search strategy

Bibliographic search of publication in rational use of drugs

Two of the authors reviewed the titles and abstracts of all articles retrieved by each search engines to assess potential relevance and omit irrelevant or duplicate papers. All searches were imported to an “endnote X4” (Thomson Reuter, NY, USA) library.

To summarize and extract data, the database was designed by Microsoft Office Access 2007 (Microsoft Corporation, Redmond, WA), scanned images of the database is listed in Appendix 2. Three of the authors reviewed abstracts and extracted the data. The databases consisted of several sections: first section contained fields for characteristics and publication details of each study include main author, year of publication, year of study and journal name. Other sections included information about the design of the study, type of population, health-care setting, city of the study, topic or subject of the study and primary and secondary outcomes of the study.

For data analysis, the Access database was exported in to Microsoft Excel 2007 (Microsoft Corporation, Redmond, WA). We conducted descriptive analyses of key descriptive study variables. The results in this report are presented as bar charts. Our analyses are descriptive and do not take variability of data or potential confounders properly in to account.

Results

A total of 980 publications were resulted from all search engines. All duplicates were excluded, resulting in 668 publications (144 Persian articles and 528 in English). Out of all the complete articles that were retrieved and evaluated, 202 articles were found to have no relevant data about RUD, and the remaining (466 articles) were exported to Excel database and analyzed. The studies were organized to different categories.

The number of publications increased from 4 articles in period 1975-1994 to more than 170 articles in period 2010-2011 (Figure 1). More than half of the study designs were cross-sectional (no: 328, 72.9%) and less than 9% (no: 40) of studies were trials (Figure 2). Figure 3 and figure 4 shows the setting of studies and type of population. Hospital (no: 171, 43.3%) and patient (no: 192, 43.9%) were the most studies setting and group.

The analysis of topics have shown that most studies (no: 68, 15%) were focused on evaluation of prescribing pattern, (no: 51, 11.3%) on self-medication and (no: 41, 9.1%) on adverse drug reaction (Figure 5). less than 3.3% (no: 15) of studies were about clinical guidelines implementation and drug usage evaluation (Figure 5).

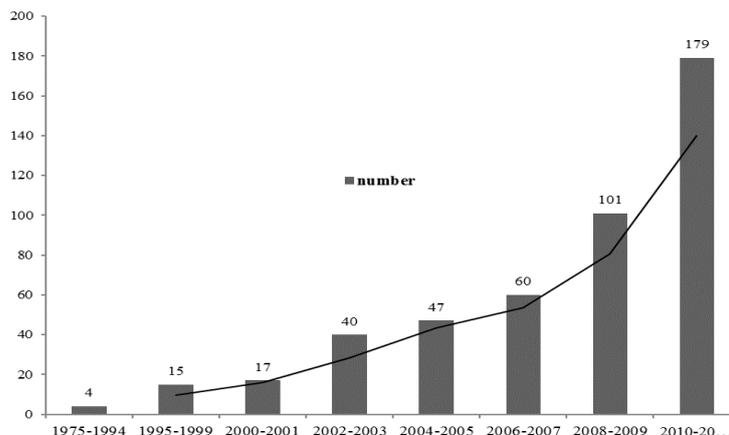


Figure 1. Number of publications by time periods.

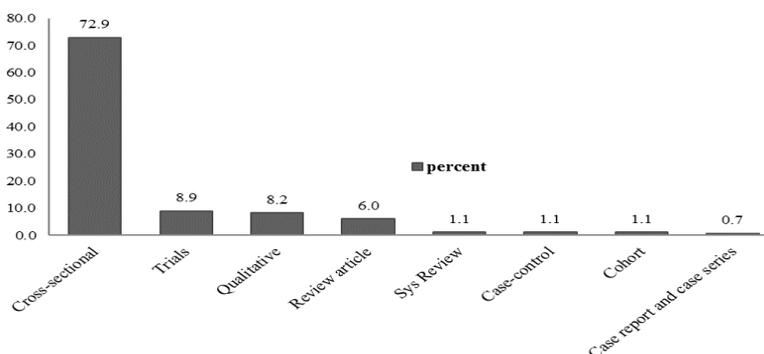
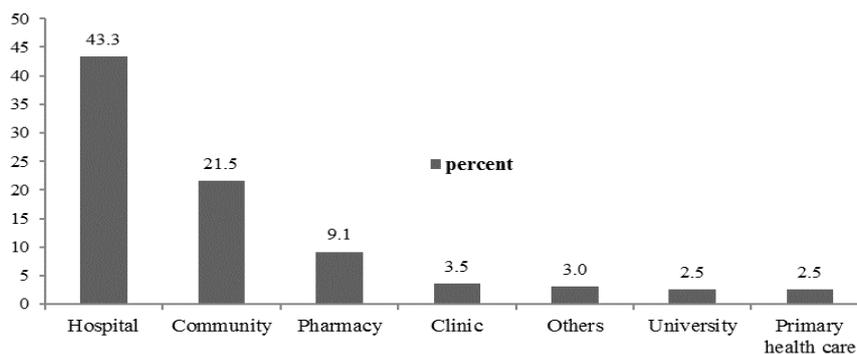
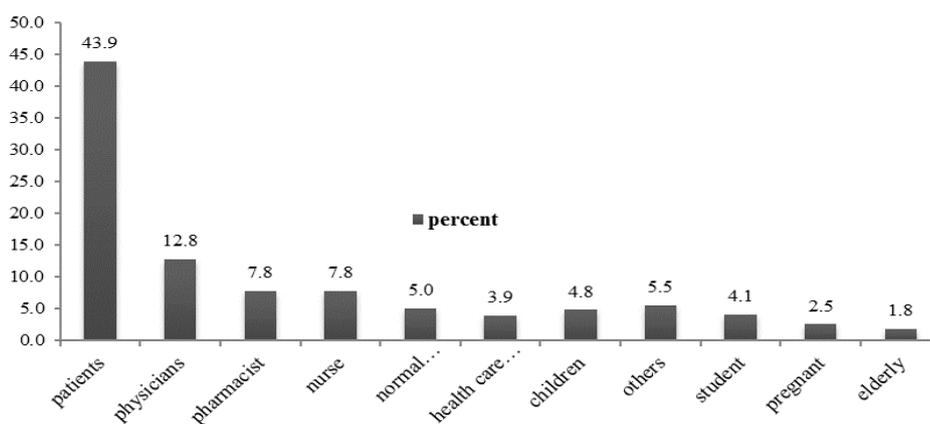


Figure 2. Types of study design.



*Clinic includes clinics which place in public or private hospitals.

Figure 3. Study setting.

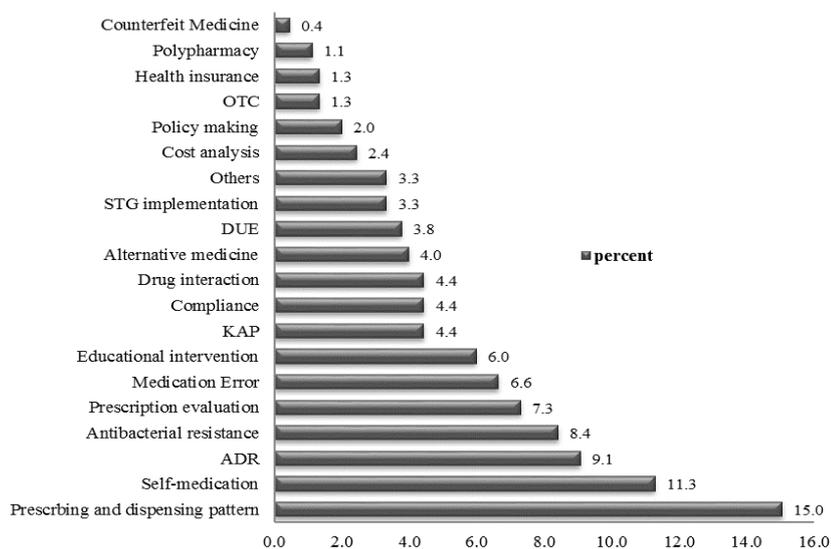


* Health care workers are including midwife, dentist and other health care workers.

* Others include herbalist, insurance company, teachers and academic staff.

* Elderly is population more than 65 years old

Figure 4. Study population.



* Prescription evaluation including studies that evaluate WHO indicators in prescription

* Prescribing and dispensing evaluation included studies that are evaluating pattern of drug prescription. These studies were different from DUE studies.

* ADR: Adverse Drug Reaction

* KAP: Knowledge, Attitude and Practice

* DUE: Drug Usage Evaluation

* OTC: Over the Counter Medicine

Figure 5. Study topics.

Small numbers of studies were focused on policy making, health insurance and counterfeit medicines. Most of the studies were performed in Tehran (no: 198) and Isfahan (no: 34).

Discussion

This study showed that despite major improvement in rational use of drugs studies, much still remains undone in this area in Iran. The research topics and approaches are fragmented and research studies are often designed and conducted without taking into account what is already known about rational medicines use problem or about successful intervention approaches. Methods are not standardized, which limits the quality of studies as well as comparability. Most of the studies were cross-sectional descriptive studies, and many important topics remained unexplored such as cost-benefit analysis. The focus of studies was on prescribing and utilization pattern, self-medication, adverse drug reaction and pharmacovigilance which among them, the proportion of planned interventions targeting the medicines use that were valuated with methodologically adequate research designs was very low.

Publication on clinical guidelines implementation was not considerable, there was no data regarding patient treatment according to clinical guidelines. Despite the fact that the use of antibiotic has been increased overtime in Iran, but intervention to improve or rationalize its use was not sufficient (14). Several important aspects of medicine use such as prescribing of medicine based on Essential Medicine List (EML)/formularies, implementation of clinical guideline, policy making and health insurance had not been reported. Data on the use of drugs in chronic diseases is scarce.

The majority of intervention studies were focused on prescribers in a public health setting, and just little intervention had addressed the drug use from a consumers' perspective.

Design of studies that had included the interventions for education of health providers and consumers, provider group educational process and supervision of prescribing practice appeared to be promising (12). In conclusion, the primary results of this study showed that large gaps remain to be investigated on RUD in Iran. Knowing the current studies of medicine use and existing gaps is crucial for policy makers to make investments to solve the problems.

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Appendix I. English MeSH keywords (for search in English search engines)

Administrative personnel	Education, Pharmacy, Graduate	Patient acceptance of health care
Adverse Drug reaction reporting systems	Fees, Pharmaceutical	Pharmaceutical services
Behavioral medicine	Guideline	Pharmaceutical services
Clinical Pharmacy information system	Guideline adherence	Pharmacies
Community Pharmacy service	Health care quality, Access and Evaluation	Pharmacoepidemiology
Cost –benefit analysis	Health knowledge, Attitudes and practice	Pharmacy
Costs and cost analysis	Health knowledge, attitudes, practice	Pharmacy administration
Drug costs	Health policy	Pharmacy and therapeutics committee
Drug information services	Health status indicators	Policy making
Drug interactions	Hospital costs	Poly pharmacy
Drug monitoring	Inappropriate Prescribing	Pharmacy service, Hospital
Drug resistance, Microbial antibiotic	Insurance, pharmaceutical services	Physician practice pattern
Drug resistance, microbial bacterial	Medication adherence	Practice guideline Publication- types
Drug therapy	Medication errors	Prescriptions
Drug users	Medication reconciliation	Prescriptions Drug
Drug utilization	Medication system	Quality indicator, Health care
Drug utilization review	Medication systems, hospital	Safety –based drug with drawls
Economics pharmaceutical	Medication systems, Hospital	School, Pharmacy
Economics, pharmaceutical	Medication therapy management	Self-medication
Education, Pharmacy	Non Prescriptions Drugs	Student, Pharmacy
Education, Pharmacy, continuing	Off –label use	

Appendix 2. Figure below shows the appearance of data entry interface.

Abstract No. Reviewer

First Author Year of The Study

Journal Name Publication Year

Type of The Study

- Systematic Review and Meta Analysis Clinical Trial Cohort
 Case-control Review Article Qualitative
 Case Report and Case Series Cross-sectional Others:

Type of Population

- Physician Pharmacist Nurse Students
 Other Health Care Professionals Patients Elderly
 Children Pregnant Others:

Study Setting

- Pharmacy Hospital Society unknown
 Others:

Study City

- Tehran Tabriz Kerman Shiraz Sari Isfahan Others:

Sample Size

Study Topics

- Adverse Drug Events Prescription Drug Administration
 Over-the-counter drugs Drug Interaction Polypharmacy
 Educational Intervention Counterfeit Drugs Herbals
 Self-medication Therapeutic Guidelines Antibiotic Resistance
 Policy-making Cost Insurance
 Others:

Evaluated Drug Evaluated Disease

Primary Outcome

Secondary Outcome

RUD Reliability Score

Article Quality Score