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Factors Effective in Creating Induced Demand for Medicine in Iran from the Experts' Point of View

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ABSTRACT

Background and Objective: Pharmaceutical costs account for a major part of health-related costs, and the induced demand for medicine imposes a large financial and economic burden on individuals and the whole society. Therefore, the aim of the present study is to identify the factors effective in creating induced demand for medicine in Iran.

Methods: This study is based on grounded theory approach and it was conducted in 2022. The interview questions were semi-structured and asked by experts. The initial selection of the samples was based on targeted sampling from among experts and scholars in the field of medicine and treatment from all over the country. The snowball method was used to increase the sample volume until it reached sufficiency. This research was completed by interviewing 20 experts.

Findings: The key factors effective in creating induced demand were identified in the form of 4 themes, 8 categories and 31 subcategories. The extracted themes included social, structural-organizational, economic and beneficiary-related factors. Social factors included the categories of society's culture and pharmaceutical literacy, structural-organizational factors included the categories of regulatory mechanisms and educational and political factors, economic factors included the categories of payment and insurance systems, and finally the beneficiary-related factors included the categories of suppliers and demanders.

Conclusion: Based on the results of this study, several factors play a role in the creation of induced demand for medicine, and following these factors can help policymakers formulate appropriate strategies to reduce unnecessary medicine prescription.

Keywords: *Induced Demand, Medicine, Economic Burden, Policy Making, Service Providers*.

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Introduction

One of the important topics in health cost management is the induced demand theory (1). Numerous studies indicate the existence of induced demand in health services, including medicines, laboratory tests, frequent medical visits and surgeries (2, 3). Induced demand poses a global challenge to the medical system, creating an imbalance between medical needs and deployable resources and increasing patient costs (4), where service providers can benefit from their information asymmetry and information advantage by offering treatments that are against the patient's interests (5). In recent years, induced demand has been one of the challenges of the health system in our country, which, due to the conflict between unlimited needs and limited resources, has caused an increase in the share of people in medical expenses, as well as the progression of the index of catastrophic expenses (6), which has resulted in irreparable medical, financial and economic complications for patients and their families (7).

According to the WHO, more than 50% of medicines are prescribed or sold inappropriately, and almost half of patients do not take them correctly. In fact, one of the major problems in the world is the irrational prescription of drugs that can be considered harmful and unnecessary (8). Reports indicate that about 30% of the total costs of the health sector are allocated to the supply of medicine, which is considered one of the main causes of household poverty in low-income countries (9). In addition, statistics show that the average number of medicinal items in prescriptions prescribed by Iranian doctors is two to three times higher than the global average rate (10). Due to the side effects resulting from the excessive and incorrect use of medicine and the economic problems caused by it, nowadays a strong tendency to limit the use of medicine has been proposed and planned at the international level, especially in developed countries (11). The induced demand for care also results in extensive economic losses at the national level, especially when the government subsidizes medical services and medicines (4).

In their study, Aghaee Hashjin et al. have pointed out factors such as underlying causes, structural causes due to the lack of correct policies, social causes resulting from advertisements and the atmosphere of society in creating induced demand (12). In the study of Seyedin et al., 24 effective factors in creating induced demand were identified in different classes including health system, insurer, health care provider and health care recipient (4). Furthermore, Paul mentioned receiving promotional gifts from pharmaceutical companies as an effective factor in motivating doctors and a reason for unnecessary drug prescriptions (13). In another study, Meyer pointed out a significant relationship between the level of health literacy of patients and induction demand from doctors; doctors induce additional services more to patients who have less knowledge (14). Belrhiti et al. believe that factors such as the deficiency of information management systems, low commitment of specialists, inefficient organizational communication, as well as the lack of active participation of specialists in the formulation of drug prescription policies, play a role in creating the induced demand for medicine (15).

In the healthcare system of our country, the phenomenon of induced demand can create various challenges for the health system and more importantly for the patients and prevent them from accessing basic and necessary services (16). Irrational and inappropriate use of drugs leads to prolonged treatment period, treatment failure, disease exacerbation, lack of immunity and drug resistance (17). Following unnecessary prescriptions, drug waste occurs, which can be caused by various factors, such as storing the drug in inappropriate conditions at home and expiration of the drug (18). Therefore, in order to control unnecessary prescriptions, the factors affecting the induced demand for medicine must be identified first, so the aim of the current research is to identify the effective factors in creating induced demand for medicine in Iran.

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Methods

This qualitative study was conducted based on the grounded theory approach after being approved by the ethics committee of the Islamic Azad University of Chalous with the code IR.IAU.CHALUS.REC.1400.038 in 2022. The research community included experts and scholars in the field of medicine and treatment of the Ministry of Health, Treatment and Medical Education. Academic staff members of health and treatment service management and health economics and social medicine groups, pharmaceutical and professional specialists and doctors with at least 10 years of executive activity in the field of medicine were included in the study, and those who were not willing to participate in the interview were excluded. The data collection tool included a semi-structured questionnaire that was prepared by reviewing the texts and with the help of expert professors for interviews. Texts with the keywords "Induced demand", "Irrational use", "Medicine" and "Healthcare services" in Google scholar, PubMed, ScienceDirect, Scopus, SID, Magiran and Web of Science databases in national and international journals in Farsi and English were reviewed based on MeSH terms.

In order to obtain the most useful samples, the purposive sampling method was used first. In other words, people who were knowledgeable in this field and had valuable experiences were interviewed. Then they were asked to introduce experts in this field; The research reached saturation by interviewing 20 experts. All the interviews were recorded and the time of the interviews varied between 45 and 65 minutes. The implementation of the interviews was done immediately after the end of each session in order to know the time of data saturation and also to increase the accuracy of the implementation of the texts. After listening several times to each recorded file, the researcher proceeded to write and type the text of the interview. In order to achieve the credibility of the interview in qualitative research, first a few interviews were conducted by the researcher before starting the research, then for the validity of the data, the first interviews were examined by the professors in terms of the correctness of the task. After the necessary corrections, the researcher started working. To increase the reliability of the findings, a number of interviews were referred to the relevant interviewees after being implemented in the text and the accuracy of the data was ensured. The "authenticity of information", "reliability" and "confirmability" of data have been of interest to researchers. In this regard, the audio file of the individual's own interview along with the written text of the interview was sent to the interviewees to prove the use of direct quotations from the people and to avoid personal impressions from the researcher and to confirm the accuracy of the data. Data were simultaneously collected, categorized and sorted. In order to extract the content of themes, categories and sub-categories, open, axial and selective coding was used. In open or first level coding, the primary analysis and breaking of the data was done and the data were broken into the smallest unit, i.e. sub-categories (items). In axial or the second level coding, patterns in the data were identified and categories were determined. The requirement of this stage was to constantly compare the data and find similarities and differences in order to separate the data and put them in the appropriate categories. Selective coding or the third level of coding was the next stage during which the categories were linked to the central categories or within the themes and the theory was formed. Themes, categories and sub-categories (items) were extracted. MAXQDA version 18 was used for qualitative data analysis.

Results

12 participants (60%) in the interview were men, and the highest frequency (40%) was related to people who were in the age group of 40 to 49 years (Table 1). Effective factors in the creation of induced demand

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for medicine in Iran were identified in the form of 4 themes, 8 categories, and 31 sub-categories, which are summarized in Table 2.

Table 1. Demographic information of people participating in the interview of effective factors in creating induced demand for medicine

Variable	Number(%)
Gender	
Male	12(60)
Female	8(40)
Age	
30-39	6(30)
40-49	8(40)
50-59	6(30)
Occupation	
Professional pharmacist	3(15)
Academic Staff Member of the University of Medical Sciences	13(65)
Physician	4(20)

Table 2. Themes, categories and sub-categories related to the main factors affecting induced demand for medicine in Iran

Theme	Category (sub-theme)	Sub-category (item)
Social	Society culture	People's misconceptions about the use of medicine
		The atmosphere caused by blind acceptance of the opinions of the medical community
	Pharmaceutical literacy of society	Poor literacy of people in the field of medicine
		The effect of advertising
Structural-organizational	Supervisory mechanisms	Lack of codified judicial laws
		Failure to use an efficient monitoring system
		Conflict of interest between observers and service providers
		Lack of authority to deal with induced demand
		Increase in the number of pharmaceutical companies
	Educational and political	Failure to implement clinical guidelines
		Lack of active participation of doctors in formulating policies such as the list of essential drugs
		The weakness of the educational system in the training of ethics-oriented doctors
		The privacy of the structure of the pharmaceutical system

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Economic	Payment System	The attractiveness of making money in the treatment sector Inappropriate payment system
	Insurance	Effects of supplementary insurance Lack of strict supervision in insurances Less price sensitivity of patients due to insurance coverage
Beneficiaries	Factors related to the supplier	Inadequate knowledge of doctors Freedom of doctors to prescribe all kinds of drugs Customer satisfaction Abuse of the weakness of the patient's knowledge Abuse of medical influence Ignoring medical ethics Inappropriate communication between doctors and pharmacies and pharmaceutical companies Financial incentives
	Factors related to the demander	Incorrect request from the doctor The patient's lack of knowledge about the side effects of drugs Patient's lack of awareness of their rights See a doctor for very simple issues Easy access to doctors and specialists

Part of the effective factors in inducing demand is due to social causes, which include the cultural classes of the society and the pharmaceutical literacy of the society. False beliefs of the people, the atmosphere caused by the blind acceptance of the opinions of the medical community, the weak literacy of the society in the field of medicine and advertisements that affect the relationship between the patient and the doctor are other reasons for induced demand, which are categorized under the title of social causes. In the following, some of the opinions of the interviewees in relation to the mentioned items are presented:

One of the interviewees stated: "Representatives of pharmaceutical companies meet with doctors, and they promote their brand. Sometimes, by considering rewards and gifts for doctors, they motivate doctors to prescribe unnecessary drugs". Another interviewee said: "The advertisements of pharmaceutical companies and pharmacies for the doctors who interact with them, and the doctors' prescriptions and recommendations to obtain drugs and products from these companies and certain pharmacies, increase the induced demand". Moreover, another interviewee said: "Doctors prescribe different medicines based on what they have learned and by trial and error. On the other hand, due to the lack of medical literacy, the patient accepts the doctor's advice and suffers from complications after taking inappropriate medicines and returns to the doctor to treat the main problem and side effects". Another interviewee said: "People go to the doctor for the smallest problems, and regardless of the side effects of the medicine, they expect the doctor to prescribe all kinds of medicinal items". Another interviewee said: "Most patients think that if the doctor does not prescribe what they want or if he prescribes less medicine, it is a sign of the doctor's incompetence".

Structural-organizational causes: based on the interviews conducted, these factors are related to the way of organizational culture governing the health system, including regulatory mechanisms and educational and political factors. The category of regulatory mechanisms includes the sub-categories of lack of codified judicial laws, lack of use of an efficient regulatory system, conflict of interest between supervisors and

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service providers, lack of authority to deal with the phenomenon of induced demand and the increase in the number of pharmaceutical companies, and the category of educational and political factors includes non-implementation of clinical guidelines, lack of active participation of doctors in formulating policies such as the list of essential drugs, weakness of the educational system in the training of ethics-oriented doctors, and the private nature of the structure of the pharmaceutical system. In the following, some of the opinions of the interviewees are presented in relation to the mentioned items:

One of the interviewees states: "Unfortunately, doctors prescribe based on what they have learned and do not follow a specific treatment protocol". Another interviewee said: "The lack of standard clinical guidelines in the country has increased the incidence of induced demand. If clinical guidelines are developed, the type and dosage of drugs required for each disease will be standardized; in this case, additional prescriptions will no longer be made". Another interviewee said: "The lack of proper supervision in the production, import, distribution, and sale of drugs is one of the factors influencing the creation of induced demand for medicine". Another interviewee said: "Privacy of the structure of the pharmaceutical system creates a financial and commercial incentive to produce, distribute and sell unnecessary drugs". Another interviewee said: "Sometimes the defect in the educational system of the country's medical sciences universities for the training of ethics-oriented doctors leads to the creation of induced demand". Another interviewee said: "The increase in the number of drug manufacturing companies has caused their managers to do extensive advertising to sell their drugs. This issue is one of the reasons for induced demand. In this regard, the granting of establishment licenses to companies should be reviewed". Another interviewee states: "The lack of active participation of doctors in formulating policies such as the list of essential drugs and top-down approaches to formulating and implementing such policies are other influential factors".

Economic causes: Experts consider economic causes to include factors related to payment and insurance systems. The payment system includes the subcategories of the attractiveness of the treatment sector and the inappropriate payment system, and insurance includes factors such as the effects of supplementary insurances, the lack of careful supervision in insurances, and the lower sensitivity of patients to price due to insurance coverage. In relation to the improper payment system, one of the interviewees said: "The efficient payment system leads to incentives for doctors to prescribe unnecessary and expensive drugs". Another interviewee said, "When a doctor knows he/she is getting more money per service, he/she naturally prescribes more services". Another factor related to insurance organizations in inducing demand is the lack of accurate supervision in insurances. In this regard, one of the interviewees stated: "Insurance organizations, on behalf of the insured, should have an accurate supervision on doctors' prescriptions, but unfortunately, this is not done, and this itself leads to the creation of space for induction by doctors". Another participant said in this regard: "If the doctor knows that his prescriptions are regularly recorded and analyzed under the system, he will pay more attention to his prescriptions and the possibility of abuse will decrease". A participant considers the presence of supplementary insurances to increase the number of patients, which increases the costs of the health sector, and states: "Covering the services provided by supplementary insurances creates an attitude in some people to make the most of it for free medicines and facilities. In the meantime, some doctors may intentionally or unintentionally induce demands in patient".

Factors related to beneficiaries: Based on the interview conducted, factors related to beneficiaries were placed in two categories of factors related to suppliers and demanders.

A) Factors related to the supplier: according to experts, doctors play a role in inducing demand in patients. Factors related to doctors in several subcategories include insufficient knowledge of doctors, freedom of doctors in prescribing all kinds of drugs, obtaining customer satisfaction, abuse of weak knowledge of patients, abuse of medical influence, ignoring medical ethics, improper communication between doctors, pharmacy, and pharmaceutical companies as well as financial incentives. One of the experts said: "Doctors

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make decisions about medical care on behalf of patients, doctors do not perform the role of representative correctly in all cases, and their advice is not ethical and is influenced by their personal interests". One of the experts states: "Unfortunately, sometimes, due to insufficient knowledge and misdiagnosis, the doctor prescribes unnecessary drugs, which causes a lot of physical and mental harm to the patient". Regarding the inappropriate relationship between doctors and pharmacies and pharmaceutical companies, one of the experts said: "Receiving subsidies from pharmaceutical companies and pharmacies causes the induced demand of service providers in hospitals to provide certain drugs with a certain brand". Regarding the doctor's effort to gain the patient's satisfaction, one of the participants stated: "Unfortunately, doctors comply with the patients' requests to prescribe unnecessary drugs in order to gain more income and gain their satisfaction for next visits".

B) Factors related to demanders: factors related to the demander or the patient include incorrect request from the doctor, patient's lack of knowledge about the side effects of drugs, patient's lack of knowledge about their rights, going to the doctor for very simple issues and easy access to doctors and experts. Below are some of the interviews conducted with experts regarding the mentioned cases. Regarding the incorrect request from the doctor, one of the experts said: "Sometimes, due to the wrong idea they have about their illness, patients request drugs that are not compatible with their real needs, and this causes moral hazard and ultimately induced demand". Another participant pointed out that patients are not aware of their rights and said: "One of the problems of our health system is that people are not fully aware of their rights. They don't ask the doctor questions, for example, they don't ask what the reason for prescribing a certain drug is". A participant raised the issue of easy access to doctors and specialists and stated: "We have a structure that allows the patient to access a doctor with any level of expertise, and this approach increases the possibility of unnecessary referrals to specialized levels".

Discussion

In this study, the effective factors in reducing the induced demand of drugs from the experts' point of view were categorized in the form of 4 themes including social, structural-organizational, economic and beneficiary-related factors. The social factors included the cultural classes of the society and the medical literacy of the society, and the false beliefs of the people and the effect of advertisements were the most important social reasons. The structural-organizational factors included the classes of regulatory mechanisms and educational and political factors, which are the most important structural-organizational reasons. Economic factors included payment system and insurance classes, and free insurance coverage and lower sensitivity of patients to price due to insurance coverage were among the most important economic factors. Finally, the factors related to the beneficiaries included the supplier and demander categories, which can be attributed to improper communication. We can also point out the inappropriate communication between doctors and pharmacies and pharmaceutical companies, and financial incentives and lack of awareness of the patient about the side effects of drugs. The present study showed that many other related factors are involved in this multifactorial process. Regarding the social field in the current research, it was found that the weak literacy of the society in the field of medicine and the effect of advertisements are effective factors in the emergence of induced demand. In his study, Meyer pointed out the poor literacy of service recipients as the main cause of induced demand from service providers (14). Noguchi et al. also pointed out in their study that in most cases, consumers with less information cannot reject the services offered by suppliers (19). However, in the present study, regarding the patient, in addition to the lack of awareness and poor drug literacy of the patients and the effect of advertisements, other factors were also mentioned, including people's false beliefs about the use of drugs and the atmosphere caused by the blind

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acceptance of the opinions of the medical community. According to the results of the current research, several factors play a role in induced demand for medicine, which means that the health system is a multi-factor system and cannot be considered separately (20). It is important to study the changes in demand for medicine, study the factors related to these changes, explain the reasons for these changes and analyze the impact of the changes on people's health. This helps policy makers make appropriate decisions about drug procurement, regulation of drug prescription and distribution, training of pharmacists, and launching educational campaigns targeting the general public (21).

In the current research, regarding the structural-organizational dimension, non-implementation of clinical guidelines and the non-use of an efficient monitoring system were mentioned as effective factors in creating induced demand for medicine. In a study, Otoom et al. listed the main causes of irrational use of drugs as poor medical documentation, lack of education for the patient about the disease and drugs, lack of a family physician system, lack of standard treatment instructions, and lack of continuous training for doctors and pharmacists (22). In their study, Karimi et al. consider insufficient knowledge and skills and low adherence to ethics in a small number of doctors as the causes of induced demand (23). The nature of the disease to be treated (e.g., chronic vs. acute or severe vs. mild) is a key factor in understanding people's drug-taking behavior (24). In their research, Rowe et al. found the lack of supervision and effective written instructions as one of the effective factors in irrational drug prescription by doctors (25). Hilger states that the service provider always chooses the most profitable treatment. Therefore, doctors' treatment options are determined by their pricing decisions. In a valid market, doctors use their information advantages to over- or under-treat patients in order to pursue their interests (26). In the current research, more factors have been mentioned, including the lack of authority to deal with the phenomenon of induced demand, the lack of use of an efficient monitoring system, the conflict of interests of supervisors with service providers, the increase in the number of pharmaceutical companies, the non-implementation of clinical guidelines, and the lack of active participation of doctors in formulating policies of essential drugs, the weakness of the educational system in the training of ethics-oriented doctors and the private nature of the structure of the pharmaceutical system.

In the economic dimension, the present research pointed out the impact of the inappropriate payment system as an effective factor in the occurrence of induced demand. Financial factors such as inefficient payment systems may contribute to induced demand, for example, if physicians are not satisfied with the payment system, they may be encouraged to provide unnecessary or redundant procedures for service recipients (27). In the study of Asgari et al., they looked at the effect of the amount and manner of payment to providers as effective factors on induced demand and considered it relevant (28). The fee for services (SFF) system can encourage health care providers to provide unnecessary care (4). In the study of Keyvanara et al., the role of supplementary insurances, the lack of strict supervision of insurances and pharmaceutical companies and marketing in creating induced demand has been emphasized, which is consistent with the findings of the current research (29). In fact, the commercial approach of supplementary insurance leads to induced demand, they see the benefits only in more income without considering the extensive complications of over-coverage of services. In addition, one of the shortcomings of the monitoring process in insurances is the lack of possibility to monitor the accuracy of the doctor's orders, in fact, the insurers only follow the doctor and do not check whether these services were really necessary for a disease with specific characteristics. All these factors contribute to increasing the unnecessary demand for services. Mohamadloo et al. conducted a study with the aim of investigating induced demand and motivational factors related to unnecessary drug prescription. According to the results of this research, the effective factors in creating induced demand include: asymmetric information, patient expectation, poor health literacy of the patient, insufficient knowledge of the doctor in medicine, disregard for the rights of the patient, financial incentives,

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barriers in insurance companies, reimbursement mechanism, marketing and advertising of pharmaceutical companies, poor financial situation of pharmacies and social interactions (30). In the current research, in addition to the mentioned findings, factors such as the attractiveness of the treatment sector and the lower sensitivity of patients to price due to full insurance coverage have been noted.

In the current study, easy and free patient access to doctors and specialists is mentioned as one of the reasons for induced demand. Because patients can easily refer to a specialist doctor and receive specialized services contrary to their main needs. In their study, Khorasani et al. identified issues such as the patient's incorrect demand from the doctor, the patient's excessive trust in the doctor, the patient's desire to use more free services without deductible, the patient's lack of knowledge and the patient's free access to the doctor as the reasons for induces demand (31). The findings of a study by Khorasani are consistent with the findings of the current research in factors such as the patient's lack of awareness of their rights and the misuse of the patient's knowledge by the doctor. Akkerman et al. reported in a study that overestimation of symptoms by doctors as well as patients' expectations can be determinants of unnecessary drug prescription (32). In another study that was conducted for investigating the barriers to proper physician performance, a gap in clinical knowledge as well as ignorance of the patient's condition were raised as barriers to rational prescription (33). The density of doctors in a specific area has been stated as a factor that can stimulate the induced demand for medicine (34). In the current research, the incorrect demand of the patient from the doctor and the weak knowledge of doctors in diagnosing and treating the patient's condition have been proposed as the reasons for the occurrence of induced demand. In regard with the factors related to the supplier, insufficient knowledge of doctors and ignoring medical ethics have been emphasized as effective factors in creating induced demand for medicine.

Regarding the limitations of the research, due to the wide scope of induced demand in medical services, busy work, the spread of COVID-19 and the time limit of the interviewees, it was not possible to increase the duration of the interview. However, the researchers tried to manage the interview in the best way by asking the right questions and get good results. The results of the present research showed that the phenomenon of induced demand for medicine is influenced by various factors, including social, structural-organizational, economic, and beneficiary-related factors. The findings of this research help the policy makers investigate the phenomenon of induced demand for medicine with a more enlightened approach and to design and organize new strategies to reduce the induced demand in the healthcare system according to the causes.

Conflict of interest: The authors declare that they have no conflict of interest.

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