



Effective Strategies for Managing Medicine-Induced Demand in Iran: A Qualitative Study Using Grounded Theory

Zahra Mahmoudvand¹ , Azadeh Yazdani¹ , Mohammad Reza Pasha Zanousi^{2*} 

¹Department of Health Information Technology, School of Allied Medical Sciences, Mazandaran University of Medical Sciences, Sari, Iran

²Department of Health Information Technology, Boo-Ali Social Security Hospital, Neka, Iran

*Corresponding Author: Mohammad Reza Pasha Zanousi, Email: pasha_m.reza@yahoo.com

Abstract

Background: Following the phenomenon of induced demand, a significant allocation of resources is directed toward the pharmaceutical sector. An increase in induced demand for medicine can adversely affect the performance of the health system and impose substantial financial burdens on individuals and society. Therefore, this qualitative study aimed to identify effective strategies for managing medicine-induced demand in Iran.

Methods: This study employed a qualitative design with a grounded theory approach, conducted in multiple stages. Initially, a systematic review of the literature was performed, followed by the development of semi-structured interview questions based on the review findings and insights from the experiences of various experts. Data from the interviews were analyzed using MAXQDA software (version 18) to extract themes, categories, and subcategories.

Results: A total of 30 relevant articles were identified through the literature review, aligning with the study objectives. Strategies for managing the induced demand for medicine in Iran, derived from interview data, were categorized into three themes, seven categories, and 20 subcategories. The main themes included planning, organizational-structural strategies, and economic factors. These themes encompassed seven categories, including societal culture, medication literacy, service delivery methods, regulatory mechanisms, political mechanisms, payment systems, and insurance. Notably, key factors influencing induced demand included physician performance monitoring, insurance restrictions, advertising and marketing limitations, and changing societal attitudes.

Conclusion: This study proposed strategies for managing induced demand for medicine in Iran. These strategies can improve efficient resource management, control healthcare costs, and ultimately enhance the quality of healthcare services provided to patients.

Keywords: Induced demand, Medicine, Management, Qualitative research

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Introduction

Theory of induced demand is a key topic in the field of health economics (1). Essentially, induced demand refers to the provision of unnecessary care or services to patients or clients within the healthcare system, driven by the exercise of authority and the influence of expert requests (2). As a complex issue, induced demand poses significant challenges for healthcare systems worldwide (3).

In Iran, induced demand, stemming from the conflict between unlimited needs and limited resources, has contributed to rising healthcare costs for the population and placing immense financial pressure on the healthcare system (4). Induced demand diverts resources to non-priority needs, disrupting the optimal allocation of national resources. Even when patients bear the costs,

the overall distribution of income remains inefficient (5). A significant portion of resources is allocated to the pharmaceutical sector, due to induced demand for medicine. For instance, per capita drug costs in 2005 and 2006 ranged from \$7.61 in low-income countries to \$431.6 in high-income countries, highlighting considerable disparities across income groups (6). Pharmaceutical expenditures constitute a substantial part of health-related costs; in many countries, drug costs are regarded as a critical economic challenge (7). Reports indicate that approximately 30% of total healthcare costs are spent on medications, resulting in household poverty in low-income countries (6). According to the World Health Organization (WHO), over 50% of drugs are inappropriately prescribed or sold, and almost half of patients do not administer them



correctly (8). One of the global health challenges is the irrational prescription of drugs, often resulting in harm or unnecessary treatment (9). The improper and excessive use of medications leads to the waste of resources and subsequent health and economic burdens for patients (8). WHO statistics show that among 20 countries with the highest drug consumption rates, Iran ranks first. In addition, the average number of medications prescribed by Iranian physicians is two to three times higher than the global average (7). The irrational and inappropriate use of drugs can cause prolonged treatment durations, treatment failures, disease exacerbations, weakened immunity, and increased drug resistance (10). Drug wastage also results from unnecessary prescriptions, influenced by various factors, such as storing medications improperly at home and drug expiration (11). Induced demand for medicines increases the risk of drug smuggling, as physicians may prescribe drugs outside the official formulary, encouraging patients to seek medications through illicit channels due to low health literacy. Therefore, patients often obtain drugs via underground networks that facilitate smuggling (10).

Several studies have identified the causes of induced demand in Iran's health system. These include the complexity of health services, clinical uncertainty, inadequate use of clinical guidelines, weaknesses in the referral system, low tariffs for health services, inefficient payment methods for health providers, increasing number of health providers, low patient health knowledge, advertising, inappropriate policies, and insufficient monitoring and control (12).

Considering the above-mentioned issues, policymakers and healthcare managers must implement appropriate strategies to reduce the induced demand for medicine. Doing so can diminish the adverse effects of excessive and incorrect use of medications and alleviate associated economic burdens. Moreover, such measures would contribute to more efficient healthcare management. Accordingly, the present study aimed to identify effective management strategies to address induced demand for medicine in Iran.

Methods

This study employed a qualitative design with a grounded theory approach.

Participants

The participants included faculty members specializing in healthcare service management and health economics, pharmacists, and physicians with at least 10 years of work experience (Table 1). Purposive sampling was utilized to select individuals with extensive knowledge and valuable experiences. To enhance the diversity and richness of data, the snowball sampling method was also employed, which involved obtaining recommendations from initial

Table 1. The participants' characteristics

Variable		Frequency	Percentage
Gender	Male	12	60
	Female	8	40
Age (year)	30-39	6	30
	40-49	8	40
	50-59	6	30
Occupation	Pharmacist	4	20
	Faculty member specializing in healthcare service management	8	40
	Faculty member specializing in health economics	4	20
	General practitioner	4	20

participants to identify additional knowledgeable experts. Sampling continued until data saturation was achieved, resulting in interviews with 20 experts.

Data collection

Data were collected through semi-structured interviews, designed based on a thorough literature review and in collaboration with expert professors to ensure relevance and comprehensiveness. The literature review was conducted using keywords such as "Induced Demand", "Irrational Use", "Medicine", and "Healthcare Services" across multiple databases, including Web of Science, PubMed, Scopus, Science Direct, Google Scholar, SID, and Magiran. The search was performed using MeSH terms, yielding 30 articles aligned with the research objectives. All interviews were coordinated and conducted by the research team from June 1 to November 1, 2023. In total, 20 interviews were carried out, of which 13 were conducted in person at participants' workplaces and 7 via video conference. All interviews were conducted by a researcher (M.P.), who received formal training in qualitative interviewing. The duration of interviews ranged from 45 to 65 minutes.

To ensure accuracy and depth, interviews were transcribed verbatim immediately after each session, allowing the researcher to monitor data saturation and enhance validity. Participants were intentionally selected to maximize diversity in experiences, and data collection continued until saturation was reached. The most appropriate semantic units were identified for analysis. The internal validity of the content analysis was assessed through face validity. Content validity was supported by a panel of experts (including the research team) who assisted in generating concepts and coding themes. Participants also reviewed the interview transcripts and extracted codes to comment on their validity and accuracy; any discrepancies identified were thoroughly examined and addressed. The researcher further clarified any unclear or misunderstood participant information via phone call and email. To ensure confirmability, all methodological steps were clearly documented and reviewed by several experts.

To enhance the reliability of the study, a comprehensive review of the data was conducted by an external academic with expertise in healthcare service management.

Data analysis

Data analysis was conducted concurrently with data collection using a grounded theory approach, facilitating a dynamic understanding of emerging insights. Thematic analysis was used to interpret the qualitative data, following Braun and Clarke's six-step framework, including familiarization with the data, initial coding, searching for categories, examining categories, defining and naming categories, and preparing a report (13).

The interview data were first transcribed and coded. During open coding, the researcher used the participants' exact words and generated as many codes as possible to capture the full scope of the data. Both the meanings expressed by participants and the meaningful codes created by the researcher based on concepts within the data were utilized. In axial coding, the researcher compared and contrasted these codes, organizing them into clusters or categories that reflected their relationships and shared characteristics. The goal was to establish logical connections among groups and their subcomponents. MAXQDA software (version 18) was used for qualitative data analysis, supporting systematic coding, categorization, and theme development.

Results

Data saturation was achieved after interviewing 20 participants. The characteristics of the participants are presented in Table 1. Overall, 60% of the interviewees were men, and most of them were in the 40-49 age range. Faculty members specializing in healthcare service management comprised the largest group among the participants.

According to the interviews, effective strategies for managing induced demand for medicine in Iran were categorized into three themes, seven categories, and 20 subcategories, as summarized in Table 2.

Theme 1: Planning

The findings indicated that a primary strategy for managing induced demand for medicine involved planning, which included categories such as societal culture, medication literacy, and service delivery methods. Relevant participant quotes are as follows:

Regarding attitude change through public media, one of the participants stated:

"Many people think that because they pay a premium fee, they should make the most of it. Many of their visits are unnecessary. We should try to change people's attitudes toward health insurance via public media".

Concerning the institutionalization of a self-care culture, the same participant stated:

"If people acquire the necessary skills to maintain their health, the number of unnecessary referrals and prescriptions will decrease."

Regarding awareness of patient rights, one of the participants explained:

"Many patients are not familiar with their rights and are unaware of the patient rights charter. Educating them about their rights will increase their understanding of their demands from physicians and prevent demand induced by physicians."

Participants also emphasized improving social literacy about medicines, with one remarking:

"People can increase their knowledge about medicines by consulting reliable scientific websites and pharmaceutical journals, which helps prevent physicians from taking advantage of patients' lack of knowledge about prescribed medications".

Furthermore, the implementation of a family physician-based referral system was highlighted as an effective measure to reduce demand for medicine. One participant mentioned:

"A system where services are provided based on patients' actual needs, with a leveling approach, can reduce unnecessary referrals and costs. For instance, a trusted family physician can prevent unnecessary specialist visits by providing timely primary care services".

Some participants suggested managed care models to prevent drug-induced demand, with one stating:

"Following the health system of advanced countries, insurance organizations should develop a managed care package that localizes services needed by the people under their coverage at a specific price. The purpose of this approach is to create a care system with a treatment protocol clear for clients."

The interviewees underscored the importance of electronic health records (EHRs) as an effective strategy for managing induced demand for drugs. Accordingly, a participant said:

"Establishing comprehensive, integrated electronic health records would prevent duplicate and unnecessary prescriptions."

Theme 2: Organizational-structural strategies

Experts identified regulatory and political mechanisms as key organizational and structural strategies:

Many experts believed advertising restrictions could prevent induced demand for medicine. For instance, a participant noted:

"Drugs should be removed from the list of commercial goods and should not offer advantages to industry stakeholders. The primary benefit should always be for the consumer or patient."

Regarding the implementation of clinical guidelines as a strategy to deal with induced demand for medicine, one of the participants said:

Table 2. Management strategies for medicine-induced demand in Iran

Theme	Category	Subcategory
Planning	Societal culture	Changing attitudes via public media
		Institutionalizing self-care culture
		Raising awareness about patient rights
	Medication literacy	Increasing societal health literacy concerning medicines
		Creating a family GP-based referral system
	Service delivery methods	Implementing managed care
Organizational- structural strategies	Regulatory mechanisms	Using electronic health records
		Applying restrictions on advertising and marketing
		Implementing clinical guidelines
		Monitoring the performance of physicians
		Monitoring the performance of pharmaceutical companies
	Political mechanisms	Managing demand through consultation
		Developing clinical guidelines
		Actively engaging physicians in formulating policies, such as compiling a list of essential drugs
		Providing ethical training for physicians
		Separating policymakers and executives
Economic factors	Payment systems	Encouraging reduced insurance use
		Reforming payment systems
	Insurance	Implementing financial penalties for service recipients
		Applying insurance restrictions

“The issuance of clinical guidelines can establish national standards for prescribing, which would promote rational consumption and cost-effectiveness.”

According to experts, physicians play a major role in inducing demand for medicine, and due to their close relationship with patients, they are often the first trigger of demand for medicine. This underscores the importance of monitoring the performance of physicians. One interviewee explained:

“Doctors make decisions on behalf of patients about medical care. However, they do not always represent patients correctly, and their advice is not always ethical, as it can be influenced by their personal interests. That is why they may unnecessarily inflate the patient’s demand for medicine. Thus, regulatory mechanisms are necessary to monitor the performance of doctors.”

Some participants suggested that monitoring pharmaceutical companies could be another approach to address induced demand for medicine. One participant stated:

“Receiving subsidies from pharmaceutical companies and pharmacies causes induced demand, prompting service providers in hospitals to prescribe specific drugs or brands. These practices should be controlled through monitoring the activities of pharmaceutical companies.”

By providing appropriate advice, physicians can also inform patients and help avoid unnecessary demands. One participant commented:

“Sometimes, patients, due to misconceptions about

their illness, ask for medications that do not align with their actual needs, and this causes moral hazard and ultimately leads to induced demand for medicine. When doctors visit patients, they should provide information about the nature of the disease and how to treat it. By doing so, the unnecessary demand for medicine will be decreased.”

The importance of developing clinical guidelines was also emphasized by several interviewees, regarding them as a standard tool for physicians and patients. An interviewee asserted:

“The absence of standardized clinical guidelines in the country has increased induced demand for medicine. If clinical guidelines are developed, the type and dosage of drugs required for each disease will be standardized, hence unnecessary prescriptions will no longer be made.”

Several experts believed that involving physicians in policy formulation, such as creating a list of essential medications, could effectively decrease induced demand for medicine. An interviewee said:

“Doctors, due to their specialized knowledge and close relationships with patients, can best help compile a list of essential drugs. Their non-participation in this process and its implementation at all levels is a major obstacle to managing induced demand for medicine.”

Many interviewees emphasized the need to reform the educational system and to train personnel with an ethical orientation. One participant remarked:

“Educational systems should be designed based on

ethical and professional principles, and there should be legal frameworks ensuring that principles of medical ethics are upheld during the diagnosis and treatment of patients”.

Participants also pointed to the separation of policymakers and executives as another strategy to prevent induced demand for medicine. One interviewee explained:

“Conflicts of interest are another issue. For example, when policymakers are also owners of pharmaceutical companies and practicing doctors, it creates a conflict. Policymaking, implementing, and monitoring should indeed be separated from each other; one person should set protocols, another should implement them, and a third should monitor and supervise the process. In this case, the overall benefit outweighs personal interests”.

Another strategy to decrease the induced demand for medicine identified in this study was to reduce reliance on health insurance. An interviewee stated:

“If there are incentives for people to use less health insurance, for example, lower premiums, this will lead to a reduction in unnecessary demands for medicine.”

Theme 3: Economic factors

From the experts' perspective, part of the strategies to manage induced demand for medicine is related to the economic factors, further categorized into payment systems and insurance. Here are some insights shared by participants on these issues.

Regarding reforming payment systems, an interviewee stated:

“Reforming the payment system plays an important role in controlling doctors' behavior. One of the shortcomings of our health system is the payment system that pays physicians by the number of patients they visit, which emphasizes quantity over quality. This way, the more services are provided, the more money is received by physicians. This payment system should be modified to prevent arbitrary prescription of medicine and services”.

Participants also suggested that imposing financial penalties could help curb unnecessary demand. One participant stated:

“Insurance companies should identify people who use unnecessary drugs with appropriate mechanisms and consider a higher premium for them.”

Another expert advocated for insurance restrictions:

“To prevent unnecessary prescriptions, a cap should be set for prescribed medications, along with stricter supervision during medical record reviews.”

Table 3 presents the frequency and percentage of experts' responses related to management strategies for medicine-induced demand in Iran. According to the findings, the most commonly cited strategy was monitoring the performance of physicians (90%), whereas the least was institutionalizing patient rights (20%).

Discussion

This study identified and categorized effective strategies

Table 3. Distribution of experts' responses on management strategies for medicine-induced demand in Iran

No	Subcategory	Frequency	Percentage
1	Changing attitudes via public media	15	75
2	Institutionalizing self-care culture	8	40
3	Raising awareness about patient rights	4	20
4	Increasing societal health literacy concerning medicines	9	45
5	Creating a family GP-based referral system	13	65
6	Implementing managed care	6	30
7	Using electronic health records	9	45
8	Applying restrictions on advertising and marketing	15	75
9	Implementing clinical guidelines	8	40
10	Monitoring the performance of physicians	18	90
11	Monitoring the performance of pharmaceutical companies	14	70
12	Managing demand through consultation	7	35
13	Developing clinical guidelines	13	65
14	Actively engaging physicians in formulating policies, such as compiling a list of essential drugs	9	45
15	Providing ethical training for physicians	12	60
16	Separating policymakers and executives	7	35
17	Encouraging reduced insurance use	12	60
18	Reforming payment systems	14	70
19	Implementing financial penalties for service recipients	9	45
20	Applying insurance restrictions	16	80

for managing induced demand for medicine in Iran into three main themes, including *planning*, *structural-organizational strategies*, and *economic factors*, based on expert opinions.

Regarding *planning*, participants emphasized enhancing societal pharmaceutical literacy as an effective strategy to prevent induced demand for medicine. Meyer also showed that individuals with lower health literacy are more influenced by physicians and tend to demand more services (14). Similarly, Abdoli et al demonstrated that physicians, possessing more comprehensive knowledge about conditions and available treatments, can inadvertently exploit this information to encourage unnecessary pharmaceutical care (15).

The findings also underscored the critical importance of developing and implementing clinical guidelines to prevent induced demand for medicine. Mosadeghrad et al's study highlighted that unclear health service standards and poorly defined clinical values motivate physicians to provide costly and unnecessary services. The complexity and uncertainty of a service increase the likelihood of induced demand, emphasizing the need for standardized clinical guidelines and mandatory adherence (12).

Participants further identified electronic health records (EHRs) as a vital tool for demand management. Although Iran faces structural challenges hindering the effective use of digital records, Aghaee Hashjin et al pointed out that comprehensive EHR systems enable the logging of all diagnostic and treatment procedures, facilitating performance monitoring and the proper management of limited resources (2).

Consultation and patient education were also recognized as effective strategies for managing induced demand for medicine. Abdoli et al concluded that when physicians provide correct information, patients are more likely to select cost-effective treatments (15). Moreover, mass communication media such as radio and television were cited by Shrifirad et al (16) and Fazeli et al (17) as effective factors in preventing non-standard drug consumption, consistent with the results of the present study.

In the present study, implementing financial penalties for recipients of services was suggested as one of the strategies for managing induced demand for medicine. Ansari et al also revealed that financial penalties through health services or insurance providers can prevent unnecessary services demanded by recipients (18).

In line with the present study, Kavosi et al. showed that control mechanisms such as appropriate payment methods and monitoring prescription behaviors of physicians have proven effective in reducing unnecessary care (19). Jain et al (20) and Belrhiti et al (21) highlighted the importance of strict supervision of prescriptions and responsible clinician oversight to prevent induced demand.

In the present study, regulatory mechanisms

involving advertising and marketing restrictions were also identified as effective strategies to manage induced demand for medicine. The study by Paul also indicated that promotional gifts from pharmaceutical companies motivate many physicians to prescribe more medications, contributing to unnecessary drug prescriptions (22).

The results of the present study also indicated that the active involvement of physicians in policy formulation, such as compiling a list of essential medications, can effectively prevent unnecessary drug prescriptions. Belrhiti et al reported that establishing drug committees in hospitals and incorporating physicians' opinions increased compliance with rational prescribing (21).

Many experts in the present study emphasized providing ethical training for medical personnel and creating legal frameworks to implement the principles of medical ethics in the process of patient diagnosis and treatment. Putri et al noted that induced demand, particularly when driven by personal financial interests, is an illegal medical practice that violates core medical principles such as honesty, fairness, humanity, non-discrimination, efficiency, and effectiveness. Preventing unethical practices aligns with high standards of medical professionalism and legality (23).

According to the results of the present study, the family physician-based referral system can also be considered as an organized method to reduce induced demand for medication. Similarly, Senitan et al found that high-quality referral practices can prevent redundant health services in secondary care, enhancing efficiency and cost-effectiveness (24). Kim-Hwang et al further supported this, indicating that electronic referral systems decrease unnecessary follow-up visits (25).

Conclusion

Induced demand remains a significant challenge within the health sector, contributing to rising healthcare costs for both patients and the healthcare system as a whole. Based on the findings from the present study, a variety of strategies, encompassing planning, organizational-structural strategies, and economic factors, can be employed to mitigate induced demand for medicine. Implementing these strategies can enhance the efficient management of the health system, reduce conflicts between service providers and recipients, control healthcare costs, and ultimately improve the quality of care delivered to patients.

Among the limitations of this study, the busy schedules and time constraints of interviewees were noted. However, the researchers endeavored to optimize the interview process by posing targeted questions to achieve valuable insights.

Given that the effectiveness of management strategies depends on the root causes of medicine-induced demand, future research is recommended to examine the status of

induced demand for medicine in Iran using World Health Organization indicators and to identify contributing factors.

Regarding ethical considerations, informed consent was obtained from all participants, following clear explanations of the objective of the study. Ensuring participant anonymity was also maintained throughout all stages of the research.

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Authors' Contribution

Conceptualization: Zahra Mahmoudvand, Azadeh Yazdanian, Mohammad Reza Pasha Zanousi.

Data curation: Zahra Mahmoudvand, Azadeh Yazdanian, Mohammad Reza Pasha Zanousi.

Formal analysis: Zahra Mahmoudvand, Mohammad Reza Pasha Zanousi.

Funding acquisition: Zahra Mahmoudvand, Azadeh Yazdanian, Mohammad Reza Pasha Zanousi.

Investigation: Zahra Mahmoudvand, Azadeh Yazdanian, Mohammad Reza Pasha Zanousi.

Methodology: Zahra Mahmoudvand, Azadeh Yazdanian, Mohammad Reza Pasha Zanousi.

Project administration: Mohammad Reza Pasha Zanousi.

Resources: Zahra Mahmoudvand, Azadeh Yazdanian, Mohammad Reza Pasha Zanousi.

Supervision: Mohammad Reza Pasha Zanousi.

Validation: Zahra Mahmoudvand.

Visualization: Zahra Mahmoudvand.

Writing—original draft: Zahra Mahmoudvand, Azadeh Yazdanian, Mohammad Reza Pasha Zanousi.

Competing Interests

The authors declared no potential conflicts of interest concerning the research, authorship, and publication of this article.

Ethical Approval

This study is part of a project approved by the Ethics Committee of Islamic Azad University, Sari Branch, with the ethics code IR.IAU.CHALUS.REC.1400.038.

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