

Identification of the Healthcare Services with Potential Induced Demand

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Abstract

Background and Objectives: Induced demand in healthcare is referred to as provision of unnecessary services to the patient by the health services providers, while the patient is not aware of their un-necessity. Apart from being unethical, this practice can potentially disturb the supply and demand balance in the health market, pose financial load on the patient, threaten the patient's health by imposing possible side-effects, and lead to waste of the limited national health resources. This study, aimed at investigating the nature of this phenomenon in Iran, as perceived by the healthcare experts.

Methods: TA qualitative research design was adopted. Data were collected using semi-structure interview. Participations were selected by purposive sampling method. Thematic analysis was used for extracting and categorizing the major domains of induced demand.

Findings: Four major categories of health services in which induced demand occurs were extracted from the interview data, including para-clinical services, medical services, surgical services, and pharmaceutical services. These health services domains account for 19 specific health services with the potential of induced demand.

Conclusions: The study identified the health services domains in which induced demand frequently takes place. This information can help policy-makers to devise strategies for alleviating the problem.

Keywords: Induced demand, Healthcare services, Health service providers.

Background and Objectives

The theory of *induced demand* is one of the main research issues in the texts of Health Economics [1-2]. Some services provided by physicians have induced properties, i.e. physicians knowing that patients have insufficient information and knowledge about their services, induce demands. In case that patient enjoys complete and sufficient information, such demand inducing and stimulation will not be possible [3-7].

In fact, induced demand refers to the inducement of providing, caring or selling unnecessary services,

which is along with practicing power by providers of services to the visitors of the healthcare system. Different economic and structural factors, behavior of service providers and service receivers and the information asymmetry among them are effective in induced demand [8-11], which sometimes, result in consuming services with little usefulness.

Therefore, induced demand is one of the challenges of the health system, which disturbs the supply and demand balance in the health market. In addition, it causes outcomes for patients such as financial load and the waste of their valuable time. Sometimes, it results inside-effects in patients and receivers of healthcare services due to inappropriate treatments and diagnoses. Its economic challenges are very outstanding at the national level particularly that some share of subsidies in Iran has been allocated to it [9-13].

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Different studies have indicated the occurrence of induced demand in services such as drugs, laboratory tests, frequent medical visits, and surgeries [3, 14-21]. Breech, Cromwell and Mitchell, Royster and Wilensky, and Gratton all have found evidence for induced demand in laboratory tests [14-15, 17, 22]. Bickerdyke and Izumida stated that induced demand refers more to counseling and referral services (for example, pathology or diagnostic imaging) [10, 19]. Wilensky, Royster and Scarce concluded that the number of patients' second visits to physicians is influenced by induced demand [20, 22, and 24].

There are studies conducted in Iran on induced demand as well. Mahbubi *et al.* in a study titled "Supplemental insurance and induced demand in chemical warfare victims" investigated the role of supplemental insurance in induced demand. The findings of the research indicate that some physicians may induce some false demands to patients intentionally or unintentionally for earning revenues and profit from insurances [17]. Abdoli investigated the origin of induced demand with the *theory of signaling games* without costs and asymmetric information. Accordingly, he indicated that there is the induced demand which results from asymmetric information [5]. Abdoli and Varharami compared induced demand between official and unofficial physicians and concluded that induced demand is more for using pharmaceutical and medical services by physicians [18]. These studies have investigated different kinds of induced demand with a limited and one-dimensional perspective. Khorasani *et al.* investigated the role of patients in induced demand [26].

In the present study, using conducted interviews, a comprehensive view towards the instances of induced demand will be presented because, previous studies have investigated a specific kind of services, while the present study is to provide a more comprehensive image of understanding induced demand in the health domain. Regarding the scope of induced demand in different services, we will investigate instances of induced demand in the healthcare system using the experiences of experts in Isfahan University of Medical Sciences (Iran).

Methods

The present study was conducted using a qualitative method and employing a semi-structured interview in 2012. The participants included some of the academics, physicians, hospital officials, managers of insurance organizations and researchers of health economics with executive and management experience in the

health system. In addition, they had acceptable executive or scientific experiences in the health system and knew the issue of induced demand. The sampling method was purposive in order that elites of the subject could be identified. In fact, the inclusion criteria for interviewing were having sufficient information and valuable experiences in the issue of induced demand. The exclusion criteria included those individuals who had not sufficient information about the subject or did not tend to be interviewed. Sampling continued up to data saturation. Accordingly, 17 interviews were conducted. All interviews were recorded and transcribed. The time for each interview was 30 to 90 minutes.

To confirm the validity of interviews, the interviews were conducted using guidance, experiences, and assistance of the supervisor and advisor of the project. To raise the reliability of data, they were returned to some of the participants, and their comments were adopted. Criteria such as "reliability", "trustworthiness", "dependability", and "verifiability" of the data were considered. In the present study, content analysis technique was used.

The stages of data analysis included extracting and transcribing data, being saturated in data, coding, recording reflective signs, recording marginal signs, summarizing, and developing suggestions. In the first stage, immediately after conducting the interviews, the transcription of interviews was typed and saved. In the next stage, the texts of interviews were reviewed for several times in such a way that the researchers were dominated over data sufficiently. In the third stage, data were divided into thematic units related to the main theme. Thematic units were reviewed, and coded appropriately in such a way that in each of the interviews, sub-themes were separated from each other. Then they were merged into each other and reduced. Finally, main themes were identified. Recording reflective and marginal signs is, in fact, recoding the memos having constructed in the mind of the researchers during the interviews. These signs relate memos to other parts of the data. Ethical considerations were considered during data collection, which included participants' satisfaction in recoding and transcribing the interviews. They were assured of their information confidentiality including their names and characteristics.

Results

Based on the conducted content and theme analyses, about 19 sub-themes and 4 main themes paraclinical services, health services, surgical services, and pharmaceutical services.

Paraclinical services

Paraclinical services where there is the possibility of induced demand occurrence include “diagnostic, radiology, ultrasound, angiography, MRI, CT-scan, ECG, bone densitometry, spirometry and endoscopy”. In this regard, a participant stated that: “in paraclinical ward, patients are induced. I feel this issue seriously. The costs we spend for MRI, CT-scan, and now for different laboratory tests, are very enormous” (interviewee 13).

Diagnostic laboratory tests

A participant referring to unnecessary check-ups and stated: “See! Here it is prescribed that each 6 months, I should be checked up; who says I should be checked up each six months? If they tell me incorrectly to be tested in laboratories each six months, I will do this” (interviewee 6).

Another participant referred to the repetition of doing tests: “A patient may have been tested; then, a doctor may say that I cannot accept this laboratory tests, and the same tests should be administered in another laboratory accepted by me” (interviewee 1).

Radiology

A participant mentioned to unnecessary radiology: “When a patient does not need any scintigraphy, it is performed for him/her, it contains rays and rays contain side-effects for the body” (interviewee 12).

MRI

A participant referred to a large number of MRI institutes disproportional to the real needs of the society: “See! Now in Iran or, for example, in Isfahan, more than 2 MRI institutes are not needed, may be one is needed. But you can see them everywhere” (interviewee 12). Another participant presented the inducement of unnecessary MRI by physicians in diagnostic institutes: “A physician, who is a shareholder of an MRI institute, prescribes 10 MRIs per a day, I think this is the real sense of induced demand” (interviewee 3).

CT scan

Regarding this issue, a participant stated: “CT-scan is an issue. Unfortunately, there has appeared a very bad relationship between specialized physicians and these institutes, say, these institutes say that per each patient whom you refer for doing CT-scan, some percent-

age is to be awarded to you” (interviewee 10).

Angiography

A participant, for explicating unnecessary angiography, refers to the average number of referral patients for angiography, which in case of occurring induced demands, this number is usually higher than standard level: “A physician, without observing scientific principles, has referred the patient for performing stages of angiography tests. You can assume that the number of cardiac patients, for example, 30 or 40 percent of them (it is not accurate), should be referred for performing angiography. You see, a physician refers 80% of his/her patients for performing angiography. As you see, he/she does not feel any responsibility for referring his patients for angiography” (interviewee 2).

Another participant stated this relationship as: “If you see the list of angiography, you can see that per each 100 patients, say, 20 of them really need angiography. 50-70 percent of cases are induced demands, and are not angiographic patients” (interviewee 12).

Ultrasonography

A participant refers to unnecessary ultrasonography with prohibitive costs: “Another example is the case of ultra-sonography, which can be diagnosed with lower amount of money. Ultrasonography can have 90% reliability and the accuracy of existence of embryos can be assured with 70-80% reliability by a series of tests. It means that these tests have 15-20% of reliability less than that of ultrasonography for the possibility of predicting the existence and health of an embryo.

Electrocardiography

A participant presented the issue of Electro Cardiography (ECG) with no indication in clinics as an instance of induced demand: “Cardiac physicians, who have electrocardiograms, besides their clinics, even if a patient has an electrocardiography of one or two days before, want them to prepare another new one” (interviewee 1).

Bone densitometry (BMD)

A participant discussed the unnecessary inducement of BMD: “For example, a lady aged 70 years refers to a physician, and the physician prescribes BMD for her! However, he knows that this lady suffers from osteoporosis; this prescription is an induced demand” (interviewee 11).

Spirometry

A participant stated the transcription of spirometry for a large number of patients: "For example, think that a lung specialist may have a spirometer in his office, and when you check the statistics, you can see that a large percentage of patients referred to the clinic have had induced spirometry" (interviewee 1).

Endoscopy

A participant argues about endoscopy as one of the unnecessary procedures, which physicians usually use in induced demands: "I can find different procedures by which I can conduct induced demand and raise my income by regularly performing endoscopy" (interviewee 1).

Health services

The participants presented the issue of health services in which there is the possibility of the existence of induced demand. These health services include "complementary medicine, false visit repetition, LASIK services, injections, and conservative treatment for emerging diseases".

Complementary medicine

A participant considered complementary medicine and marginal treatments as grounds for induced demand: "It is better to say that different treatments, which are not main treatment, are considered as marginal ones, and aren't so necessary, such as different traditional treatments and things, which have appeared newly. Some parts of complementary medicines are appropriate, but some others are not" (interviewee 16).

False visit repetition

Regarding this issue, a participant stated that: "In this kind of visit, induced demand can be conducted. For example, think that a patient refers to a physician every 2 or 3 months, but the physician demands him/her that he/she should refer to him every month. This is surely induced demand" (interviewee 1).

LASIK services

For this case, a participant referred to LASIK eye services: "For example, LASER services such as LASIK eye surgery or LASIK skin services. Some insurance

cover these services" (interviewee 4).

Injections

A participant presented serum injections to most patients as an instance: "We have a clinic to which all visit. In other words, each patient enters it, the doctors immediately prescribe for him or her serum injection... these are cases, which are investigable" (interviewee 10).

conservative treatments for emerging diseases

About this issue, a participant referred to conservative treatments in cancer patients: "There are some diseases, which do not respond to extra treatments even performed in the system; it means that their complete treatments are not available, but their conservative treatments are available and are costly though they know that these treatments are useless, such as cancers" (interviewee 16).

Surgery services

The participants referred to different surgery services for induced demand. These surgery services include "cosmetic surgery, cataract surgery, surgery to remove the tonsils, and caesarean section".

Cosmetic surgery

In this regard, the participants presented different instances:

"There are cosmetic surgeries in which induced demands are conducted, and now its demand in individuals is more than before" (interviewee 13). "Regarding the issue of cosmetic surgeries such as rhinoplasty, there are radical discussions in our society. So, in fact, a service which is not a real one, is offered and received" (interviewee 1). "For example, regarding hair; there are millions of advertisements claiming that they can repair your hairs; never have they been fruitful, other than they fleece you" (interviewee 15).

Cataract surgery

A participant referred to cataract surgery as: "A treatment such as cataract surgery is being performed in Iran a lot, while it has been mostly the case that a patient loses his/her eyesight so much that he/she faces eyesight problems, and then he/she undergoes a surgery. But, now, every person refers to a physician, if his/her eyesight is a little disturbed, the doctor

prescribes a surgery for the patient" (interviewee 5).

Undergoing surgery to remove the tonsils

A participant considered the surgery to remove the tonsils without scientific indication as one of the instances of induced demand: "Now tonsillectomy, the surgery to remove the tonsils without scientific indication, is prescribed for patients" (interviewee 13).

Caesarean section

A participant, relying on a high percentage of caesarean section stated: "For example, the case of caesarean section, as you can see, in Iran, 80 percent of deliveries are performed by caesarean section. Or a physician performs 80 percent of deliveries for patients using caesarian section (interviewee 2).

Pharmaceutical services

The participants presented induced demand in pharmaceutical services, which may be in the forms of pharmaceuticals or changes in the prescribed pharmaceutical types.

A participant considered the occurrence of induced demand in the number of pharmaceuticals: "The number of pharmaceuticals is very high. In Iran, we can see that if four pharmaceuticals are prescribed, some of the specialists sometimes prescribe even five pharmaceuticals and we accept it" (interviewee 3).

A participant referred to the prescription of extra antibiotics: "if a patient had taken one kind of antibiotics, he/she would have been OK. Now, a physician has prescribed two kinds of antibiotics; one of them is extra" (interviewee 1).

Another participant considered induced demand in medicinal supplements and vitamins: "In medicinal supplements or vitamins, again we can see induced demands, which are induced by pharmacies to physicians in the prescriptions of some patients" (interviewee 13).

A participant presented the issue of too many prescriptions of steroids: "For instance, now requests for drugs such as steroids have increased. The person likes to get rid of his/her disease while his/her disease is not cured; just its symptoms have disappeared" (interviewee 16).

Another participant pointed to high consumption of dexamethasone and stated: "For example, imagine how much dexamethasone consumption is there, while the society does not need this amount of dexa-

methasone consumption. Any disease that physicians cannot diagnose, they prescribe dexamethasone!" (interviewee 15).

Discussion

The objective of the present study is to present different instances of induced demand in the healthcare system using the experiences of experts and elites of Isfahan University of Medical Sciences. The results obtained from qualitative studies are mostly indicated case by case and their validity can only be confirmed in the scope of the subject and with the participants of the study. The present study was conducted in a medical science university and insurer organizations as well as among the physicians present in Isfahan. Accordingly, the obtained results, due to difference in the nature of different fields of study, cannot be generalized to all universities and fields of study. The findings indicated that the existence of induced demand in different paraclinical services is obvious. The alarming increase in the paraclinical costs indicates the increase in the demand for these services. In this regard, diagnostic laboratory tests and unnecessary checkups are frequently provided by physicians or even due to patients' demands, and sometimes, physicians consciously or unconsciously add extra cases among the type of tests which they prescribe for patients. In some cases, even physicians may want their patients to repeat the recent tests in another laboratory [27].

Radiology is one of the paraclinical services in which induced demand occurs much. For patients who do not need diagnostic radiography, it is performed without considering the side effects of its radiation. MRI is presented as one of the instances significantly involved in induced demand. Maybe it can be said that the too number of MRI institutes disproportional to the actual needs of the society is one of the indicators of this dissension.

CT-scan is another paraclinical service, which sometimes becomes unnecessary, due to the improper dependence of physicians and diagnostic institutes to a large number of prescriptions because per the number of patients, commission is considered for physicians. Angiography is another paraclinical service, which is prevalent among the cardiac diseases nowadays. To explicate unnecessary angiography, the average number of patients referring to each physician for performing angiography can be used. In case of occurrence of induced demand, usually this number is higher than the standard level. In induced demand, angiography is used for simpler diagnostic tests for cardiac diseases.

Unnecessary ultrasonography is also one of the instances of induced demand. For example, nowadays, three-dimensional ultrasonography is frequently used for diagnosing the existence and health of embryos, which puts heavy costs on the health system. ECG is also another instance of induced demand. ECG without indication in offices or clinics is considered as an instance of induced demand. Bone densitometry is among the diagnostic services as well. It is sometimes prescribed for old patients unnecessarily. Spirometry is too among paraclinical services in which induced demand occurs. Physicians who have personal spirometer, for their own benefits, easily demand their patients to perform spirometry. Endoscopy is also presented as an instance used by physicians in induced demand.

In comparison with previous studies, Hillman has indicated unnecessary use of diagnostic imaging occurring frequently in referrals themselves [28]. Doorslear and Geurts indicated that the behavior of maximizing income may occur among physiotherapists with the help of induced demand [29]. Palesh *et al.* indicated that via unwanted penetration, MRI and interferon beta have rapidly increased in Iran and induced demand occurs in them [30]. Dosoretz stated that for prostate cancer, some urologists have induced demand in using technologies [31]. Borhanzadeh reported that one of the best instances of induced demand is providing costly laboratory services, which are usually more expensive than the conventional type. Furthermore, in psychosomatics, different paraclinical tests and services for patients are demanded [32]. Different studies have found evidence for induced demand in laboratory tests [14-15, 17, and 22]. Bickerdyke and Izumida stated that induced demand occurs in counseling and referral services [12, 23]. These studies confirm the occurrence of induced demand in paraclinical services, and their results are consistent with those of the present study.

Findings of the present study for health services indicated that complementary medicines and marginal treatments are grounds for induced demand. For example, phlebotomy in clinics, hirudomedicinalis, apitherapy, and acupuncture is among the complementary treatments in which induced demand occurs significantly, without any supervision by the related organizations. One of the other health services is physician visits. False visits repetition is an instance of occurring induced demand. "LASIK services" is another ground in which induced demand occurs outstandingly [33].

Injection services are also among the services provided in clinics along with medical treatments. Some-

times, to attain benefits, most of the patients have to receive a kind of service, while it is not his/her actual needs [34]. Conservative treatment for emerging diseases such as cancer is another instance of induced demand. Most of these treatments have no necessary or proved effectiveness, and patients resort them as the only way left for them for treatment; therefore, induced demand can easily occur in them.

Delattre and Dormont indicated that induced demand by physicians is available in the health system of France, particularly in outpatient care [35]. Shi-geoka and Fushimi concluded that induced demand occurs in neonatal intensive care wards as well [36]. Hasaart concluded that his experimental analysis supports the claim of occurrence of induced demand in tonsillitis treatment, hiatal hernia, varicose veins, cataracts, hernia, spinal, and pelvic organ prolapse [37]. Borhanzadeh stated that in systems with limited services such as clinics and offices, after visiting patients, unnecessary services such as serum and ampoule injections are imposed on the patients [32]. These studies indicated induced demand in health services, and their results are consistent with those of the present study.

A lot of studies indicate that physicians conduct frequent visits for retaining their earnings [19-20, 32, and 38]. Amporfu reported that physicians ask their patients to have extra visits, which are mostly unnecessary [39]. Birch and Grytten showed that the number of dentists has significant effects on the degree of dentists' visits [14, 40]. Wilensky, Rossiter and Escarse stated that the number of patients' second visits to physicians is influenced by induced demand [20, 22, and 24]. Abdoli and Mahbubi *et al.* found out that induced demand increases the frequency of patients' visits [3, 9].

Findings of the present study for surgical services indicated that domestic surgery is one of the most obvious domains of the occurrence of induced demand because most users, without regarding its side-effects and unfavorable consequences, perform it. Cataract surgery is another kind of surgery in which the possibility of occurring induced demand is high. Surgery to remove the tonsils, without considering scientific indications is another instance of induced demand. Caesarian section is also one of the instances of occurring induced demand in the domain of surgery, which is prevalent nowadays. Mothers for whom there is the possibility doing natural delivery, caesarian section is performed without scientific considerations [41].

Cromwell, Mitchell, Fuchs, and Schroeder reported induced demand in surgeries [12-13, 15]. Borhanzadeh stated that the most harmful induced demand

is related to the diseases, which can be cured with medications, but are advised to be cured by surgery, such as caesarian section for a mother, who can have a normal vaginal delivery [32].

Findings of the research for pharmaceutical services indicated that induced demand can be in the form of high number of pharmaceuticals or change in the type of prescribed medication. Drugs in which induced demand occurs more than others include antibiotics, steroids, and gentamicin, supplements, herbs and vitamins, and dexamethasone. Another issue in unnecessary pharmaceutical inducements is the use of faster-acting drugs, which imposes extensive side-effects [42].

In comparing to previous studies, Wilensky, Rossiter, Escarse, and Abdoli declared that the number of medicinal prescriptions may be influenced by the physicians' induced demand [20, 22, and 24]. Mahboobi *et al.* indicated that according to the pharmacists' ideas, 85 percent of prescribed drugs do not enjoy specific treatment logic [9]. Furthermore, Borhanzadeh concluded that in clinics and offices, unnecessary drugs are prescribed [32].

Conclusions

The research results present different instances of induced demand in healthcare services. The most significant findings of this research include paraclinical services, health services, surgical services, and pharmaceutical services. These findings can help the policy makers identify induced demands in health services and adopt appropriate strategies to them. Our results also provide a ground for conducting quantitative research in future on the different areas of induced demand identified in this study.

Competing Interests

The authors declare no competing interests.

Authors' Contributions

The authors have made equal contribution to the study.

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