

## The impact of sanctions on procurement of capital medical equipment in the Iranian health sector: a review study

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### Abstract

**Background and Objective:** Today, medical equipment has become an integral part of all sections of healthcare systems and a significant portion of estimated costs in healthcare is allocated to this sector. Meanwhile, optimal utilization of equipment requires them to be kept operational and safe in most of their life, therefore, providing appropriate medical equipment is of utmost importance.

**Method:** This study reviewed the existing literature and extracted and evaluated the relevant articles using the appropriate keywords in the internal and external databases.

**Results** The international sanctions is one of the factors affecting the procurement of medical equipment as a result of which the people of the sanctioned countries suffer the most. According to this review, the sanctions have led to increased health tariffs and increased share of direct payment by people for healthcare expenses. The money transfer problems have caused the import of medicine and medical equipment to be very long over time and these factors have led to a negative impact on the availability and price of these items in Iran.

**Conclusion:** Since Iran needs to import many health-related raw materials and goods and services and on the other hand, the import of these goods, which are applied in production process or used, declines under the economic sanctions conditions, therefore, measures should be taken through the required policies such as motivational policies, maximum utilization of domestic capacities, foreign joint ventures and trade agreements with other countries in order to produce a part of the necessary capital and intermediary goods within the country, considering the available capabilities, so that the country's production capacity does not suffer.

**Keywords:** sanctions, procurement of equipment, capital medical equipment

### Background and Objectives

Today, in the healthcare sector, medical equipment has become an integral element, and an important part of the expected hospital costs is allocated to this sector (1). Various factors such as demographic and epidemiologic changes, increase in average age of societies, increase in chronic diseases, rapid and increasing development of expensive medical technologies, development of information technologies, increase in awareness and consequently, society's expectations of health system have led to an increase in costs of this sector <sup>2</sup>.

The medical community has gained an increasing reliance on advanced equipment and technology in diagnostic, care and therapeutic activities. Meanwhile, optimal utilization of the equipment requires that the equipment be kept ready for work and healthy in most of their lives. Therefore, the procurement of the appropriate medical equipment will be of the utmost importance. On the other hand, having enough medical equipment, proper quality, and trained personnel to work with the devices, guarantees the hospital's position in providing the best health care and prompt and accurate diagnostic services in the hospital <sup>3,4</sup>.

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In general, medical equipment is devices and facilities that can somehow be used in providing effective and all-out emergency services in health care. These pieces of equipment, tools, and supplies include all devices, appliances, mechanical and electrical appliances, means of transport and utilities that are used in (normal and immediate) service deliveries<sup>5</sup>. Also, from the economic and financial points of view, medical equipment has doubled in importance for governments. The market value of medical equipment from consumption and capital perspectives was estimated at \$145 billion in 2000 and was projected to hit \$260 billion by 2006<sup>6</sup>. Studies show that part of medical supplies and equipment in middle and low-income countries are corrupted, unusable or disproportionate to the purpose they are supposed to provide, which results in less effective service delivery<sup>7</sup>. According to the study by Diaconu et al. (2017), the inappropriate purchasing and procurement process is the most important factor and indeed the heart of this matter. The identical and inappropriate purchasing methods for a variety of technologies, incompatibility of technology with demand, high cost along with the diversity of these items and inappropriate user training, are among the challenges faced by the health system in the field of medical supplies and equipment<sup>8</sup>.

One factor affecting the process of supplying medical equipment is international sanctions. With the replacement of war and coercion by sanctions, the scope of this phenomenon has increased so much in the last decade of the twentieth century that some sanctions, like war, are considered one reality of today's life. The observation of the international scene reveals the fact that a wide range of countries, including the Islamic Republic of Iran, have faced the challenge of such sanctions at some point in their economic life and their economic security has been overshadowed by it<sup>9</sup>.

Confronting US and EU economic sanctions is considered as one of the strategic imperatives in the foreign policy of the Islamic Republic of

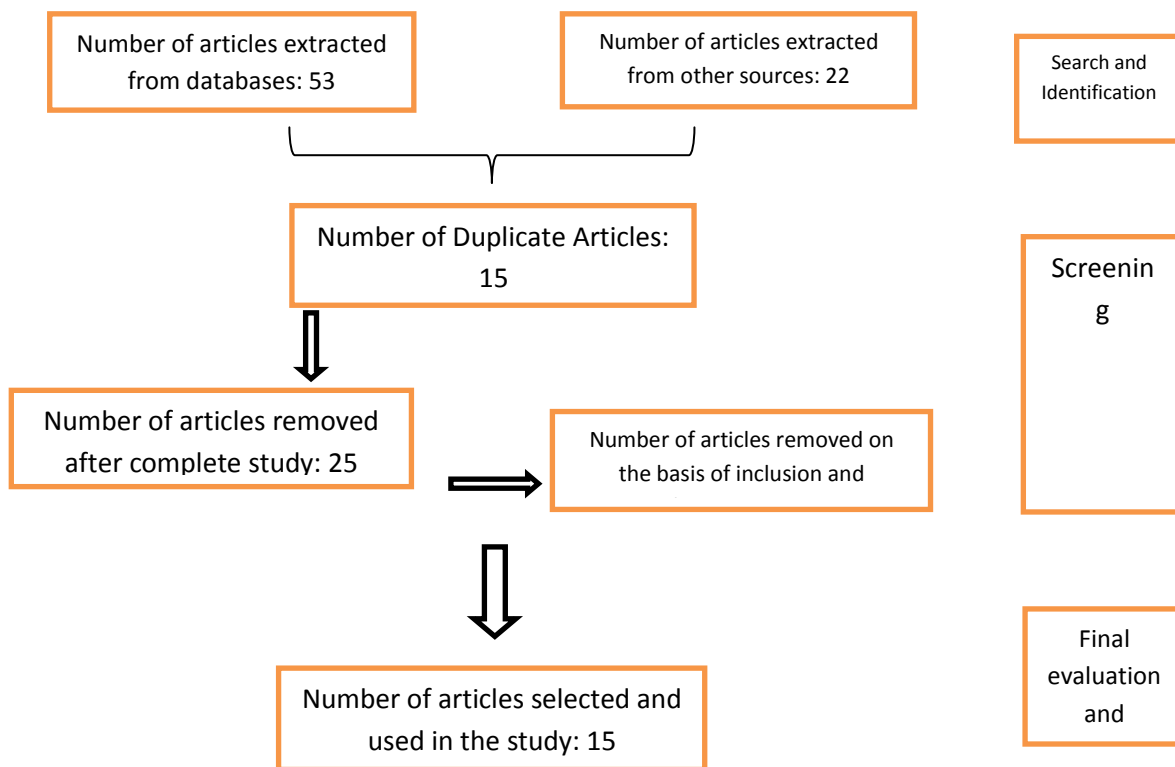
Iran. An examination of international policy developments shows that the revolutionary countries and actors in the counteraction of the international policies are facing economic and strategic constraints. We must consider sanction policy as one of the limited, gradual and phased mechanisms of counteraction with the challenging countries in the world system. US economic and strategic sanctions against the Islamic Republic of Iran have grown steadily since 1979. The most severe sanctions have been of the year 2011, named "crippling sanctions". The crippling sanctions are meant to target the financial system of the Islamic Republic of Iran and thus have imposed a variety of restrictions against Iran's economic structure<sup>10</sup>. Given the high cost of procurement and maintenance of medical equipment in hospitals and the necessity of procurement of these items to provide desired quality health services and also the necessity of procurement of a major part of these items from abroad, this paper was conducted with the purpose of the impact of sanctions on the procurement of capital medical equipment in Iran.

#### methods:

This is a review study. Related articles and papers have been searched in the form of evidence review in electronic databases and the review of library documents. In order to find and extract articles in electronic databases, keywords "sanction OR embargo", "medical equip\*", "medical supplies", "medical devices", "capital medical equip", "capital medical supplies", "capital medical devices", "purchase OR procurement", "purchase of medical equip \*", "procurement of medical equip\*" were used. All studies are in the field of healthcare sanctions that were studied as a literature review and included all databases available in the country such as SID, Iran medex, Magiran, as well as other articles and theses and reports that were made in this area. In order to access overseas studies, also searches in databases of Web of Science, Science Direct, Google Scholar, Pub Med, Scopus, Emerald, and Springer were used. In

order to extract articles and enter them into the study to compare Iran with other countries in which economic sanctions have been imposed, some axes were considered as inclusion and exclusion criteria, entry requirements of countries including countries subject to UN, EU, and US sanctions and sufficient evidence such as the article, official report, status analysis, published dissertation that can be accessed in the scientific databases were determined. Upon initial search, Iran, North Korea, Syria, Iraq, Cuba, and Russia had the above characteristics and were studied. If there are insufficient data in each country, minimum data will be reported. A comparative study of the selected countries was carried out on the

basis of the structural prerequisites mechanism, terms and conditions for the procurement of capital medical equipment, accessories, maintenance, and after-sales services. All articles were searched and extracted during the period of April to October 2019. As a result, 75 articles were extracted; that based on the inclusion and exclusion criteria, and the articles related to other countries were deleted and finally, 15 articles were selected and used.(Figur 1) All types of articles such as original, systematic review, review, case study and other types of articles were included in the inclusion criteria of this study.)...



Figur1- papers selection process

## Results:

The official purpose of the sanctions is to force Iran to abide by international law on the nuclear program. A set of banking, transport, insurance, ports, trade, goods and deals, and energy investment restrictions have cut many of Iran's business relations with the outside world. Severe sanctions have affected all economic branches but have been increasingly influential on vulnerable patients as medicine and raw material delivery for pharmaceutical companies in Iran and import and purchase of medical equipment for hospitals have stopped. In general, we found the following in literature related to this topic .

Although medicine and other sensitive medical equipment are not included in the sanctions list, difficulties in exporting medicine, financial transaction and transportation as well as fear of the probable US sanctions have created problems. Sanction by pharmaceutical companies and international banks has led to a shortage of medicines and medical equipment over recent years and months in Iran<sup>11</sup>. There have been reports of an increase in patients' deaths in Iran over the past months due to a shortage of medicines and some sensitive medical equipment. Sanctions have also been imposed as a means of forced foreign policy on several countries such as Iraq, Cuba, Libya, and the former Yugoslavia in the last few years. Although the purposes of the sanction are rarely met, the sanctions may lead to a humanitarian catastrophe<sup>12</sup>. The sanctions imposed by the United Nations Security Council on Iran are those of weapon, finance, and travel of people involved in the nuclear energy sector and missile industries and the degree of these sanctions is a long way from the comprehensive sanctions. However, their impact on society is palpable and despite the intentionality and intelligence of these sanctions, they have had detrimental effects even on unsanctioned sectors such as the health sector<sup>13</sup>. In another study, it is expressed that the sanctions, in addition to major negative effects on policies and major

government programs, have had direct and indirect impacts on Iranian citizens and their right to health, which is contrary to the generic and universal principles and values of human rights<sup>14</sup>. In another study aimed at providing the decision support system to evaluate and prioritize the risk of importing goods with the aim of managing the impacts of Iran sanctions, researchers have also mentioned that the impositions of unjust and widespread laws of sanctions have endangered the process of importing goods<sup>15</sup>. In another study which has been carried out by Iranian researchers at Razi Vaccine and Serum Research Institute regarding the impact of foreign sanctions on scientific communications and research activities, it has been stated that Razi Vaccine and Serum Research Institute has been adversely affected by foreign sanctions in both scientific and economic terms. The sanctions in the economic aspect have had negative effects on the financial problems of the institution and have caused budget limitations. This limitation, in turn, has reduced scientific communications and research facilities. In scientific terms, there have also been limitations to participation in conferences and foreign seminars, supply, and procurement of articles and scientific interactions with foreign researchers. More importantly, the lack of access to pharmaceutical standards and protocols, which is a critical factor in improving the health of livestock and poultry and treating common livestock and human diseases, has created a large gap in the institution's activity as a pharmaceutical manufacturing unit<sup>16</sup>. In another study about the impacts of economic sanctions on healthcare sector with an emphasis on Iran, it has been stated that the expansion of Islamic revolution and scientific, technical, and military development of the country has led the Western bloc to conduct hostile measures such as imposing sanctions, limiting these advances and making excuse in the pursuit of peaceful nuclear technology. These sanctions have led to a rise in healthcare tariffs, a shortage of imported medicines in the country's pharmaceutical market, an increase

in the cost of importing medical diagnosis equipment and an increase in the proportion of direct payment of medical care by the public. However, the expansion of insurance coverage and reliance on domestic empowerment in providing diagnostic, therapeutic and drug manufacturing services can also reduce the impacts of these sanctions<sup>17</sup>. Another study in Iran has been conducted with the aim of investigating the impact of sanctions on the purchase of medicine and medical devices in Iran. It has stated that in recent years, money transfer problems in Iran have made the import of medicines and medical devices take a long period of time, which has had a negative impact on the availability and cheapness of medicine. The quality of medicinal drugs and treatment of patients has also been affected due to changes in the resources of imported drugs and raw materials for locally produced drugs. Also, the increase in the mechanisms of import processes has led to an increase in the cost of purchasing which has affected the final cost of medical products for the general public. Also, changes in sources of imported medicine, as well as API of domestically produced drugs, have had a negative effect on the quality of drugs and treatment of patients. These challenges are only a small part of the problems arising from the harsh sanctions against Iran which have seriously challenged the health system of Iran<sup>18</sup>. In another related study aimed at examining the impact of economic sanctions on nuclear medicine in Iran, it has been stated that the recent unilateral withdrawal of the United States from Iran nuclear deal (Joint Comprehensive Plan of Action (JCPOA)), followed by the imposition of economic, commercial and financial sanctions on Iran has had a devastating impact on nuclear medicine, whether in the provision of radio beams or spare parts of nuclear medicine devices. In this article, it has been stated that although it appears that medicine and pharmaceuticals are not included on the list of sanctions, secondary sanctions including air freight sanctions as well as financial constraints have made it very difficult for medical companies to work. This study has

also stated that numerous reports in the past have shown the detrimental effect of previous economic sanctions on Iranian patients' health. Examining the impact of sanctions in this study has shown that the negative impact of sanctions from death to various complications of the disease has been mainly due to limited access to drugs. The most important problems have been related to cancer, malignancy, heart disease, asthma and epilepsy patients<sup>19</sup>. In another related study which has been carried out as an evaluation of the impact of economic sanctions on the Iranians' right to health by means of the assessment tool of the effects of human rights in Iran, it has been stated that the sanctions against Iran have led to a drop in the country's revenues and an increase in inflation and unemployment. These impacts exacerbate public welfare and lower peoples' ability to access the essentials of a standard life such as nutrients, healthcare, and pharmaceuticals. Also, bank, and financial and transportation systems' sanctions have led to a shortage of high-quality life-saving drugs. This study has stated that the impact of sanctions on the lives of poor people, patients, women, and children has been very high and that humanitarian exemptions have not protected Iranians from the negative and destructive impacts of these sanctions<sup>20</sup>.

Besides domestic studies in this field, foreign researchers have also examined this subject. In the UAE, researchers have been examining the subject of sanctions on medical resources in Iran and have stated that sanctions actually disrupt the supply and purchase of medical supplies and medical equipment in Iran. The purchase of some of the most vital medicines and medical equipment and raw materials of their products from the United States and Europe has been particularly challenging<sup>21</sup>. In another study, a review of the impact of sanctions on health care in Iran has taken place and it has been stated that the sanctions have affected almost every aspect of medical care in Iran so that many of the essential drugs are not available and this is of great concern<sup>22</sup>. Another study aimed at examining the impact

of economic sanctions on health in Iran, Iraq, Yugoslavia, South Africa, Haiti, Libya, Nicaragua, and Cuba shows that sanctions reduce economic activities and reduce imports of capital goods and can create undesirable health effects, especially among the elderly and those with chronic illnesses. The sanction is normally imposed with the aim of a shortage of pharmaceuticals, medical devices, and surgical equipment<sup>23</sup>. The study of sanctions in Syria has also shown that the growing sanctions on health system infrastructure have a wide range of influence and in the coming years show disastrous impacts on public health. The health sector of this country has currently been devastated by violence stemming from economic sanctions that have

affected access to healthcare, drugs and basic requirements as well as the destruction of infrastructures<sup>24</sup>. Another study aimed at examining the consequences of political sanctions on healthcare system in Iran and Iraq states that one impact of the economic sanctions is that the purchase and supply of health resources must be done through transferring foreign exchange which with the presence of the sanctions are difficult and impossible to do between Iran and the Western world. Many companies and financial institutions are refusing to deal with Iran for fear of punishment and sanction, and this may affect the import of goods, including medicine<sup>25</sup>.

Table 1: Summing up the Findings

Title	Writers	Procedure summary	Summary of the results
Sanctions against Iran: The impact on health services	Gorji (2014)	Letter to the editor in chief	The sanction of pharmaceutical companies has led to a shortage of pharmaceuticals and special medical equipment over recent years and months in Iran.
The impact of economic sanctions on health and human rights	Garfield et al. (1994)	Descriptive Analytical	- There are reports that suggest an increase in patients' deaths in Iran over the past months due to a shortage of pharmaceuticals and some sensitive medical equipment.
The impact of international sanctions on national power factors, with emphasis on UN Security Council sanctions against Iran.	Mukhtari Hashi (2015)	Descriptive Analytical	- Despite the intentionality and intelligence of these sanctions, they have had detrimental effects on the unsanctioned sectors such as the health sector.
Impact of unilateral and multilateral sanctions on Iran: Perspective on the health rights of the citizens of Iran.	Alekajbaf et al (2014)	Overview Descriptive	- Sanctions have negatively influenced Iranian citizens and their right to health directly or indirectly
A decision support system for evaluation and prioritization, the import risks to manage the effects of sanctions on Iran	Izady et al (2018)	Case Study	The imposition of unjust and wide-ranging laws of sanctions has endangered the process of importing goods.
Analysis of Razi vaccine and serum scientific institute researchers' viewpoint on	Almasi et al. (2016)	Combinative qualitative Consecutive	- The lack of access to standards and protocols of pharmaceuticals, which is an important factor in the promotion of

<b>Title</b>	<b>Writers</b>	<b>Procedure summary</b>	<b>Summary of the results</b>
the impact of foreign sanctions on scientific communications and research activities		quantitative	livestock and poultry health and the treatment of common livestock and human diseases.
The impact of economic sanctions on the health sector with the emphasis on Iran	Emamgholi Pour Sefid Dashti (2014)	Overview - Narrative	The sanctions have led to a rise in medical tariffs, a shortage of imported medicines in the country's pharmaceutical market, and an increase in the share of direct payments of people from treatment costs.
Impact of sanctions on procurement of medicine and medical devices in Iran	Hosseini (2013)	Descriptive - Analytical	The problems with money transfer have made it extremely lengthy in time to import medicine and medical devices and these have negatively affected access to and affordability of medicines in Iran.
Economic sanctions on Iran and nuclear medicine	Zakavi (2019)	Letter to the editor in chief	The review of the effect of sanctions in this study showed that the negative effect of sanctions has ranged from death to different complications of disease mainly due to limited access to the drugs.
Assessment of the effects of economic sanctions on Iranians' right to health by using human rights impact assessment tool: A systematic review.	Kokabisaghi (2018)	Systematic review	The sanctions on banking, financial system and shipment led to a scarcity of quality lifesaving medicines in Iran.
Sanctions and problems with the procurement of medical services in Iran	Heideman et al (2013)	Overview	Sanctions have affected almost every aspect of medical care in this country so that many essential medicines are unavailable.
Health affected by sanctions in Iraq: an empirical review	Akunje et al. (2001)	Overview	The sanctions actually disrupt the supply and purchase of medical supplies and medical equipment in Iran.
The health impact of economic sanctions	Garfield et al. (1995)	Descriptive - Analytical	Sanctions reduce economic activity and imports of capital goods and can cause adverse health effects, especially among elderly people and those with chronic illnesses.
Syria: effects of conflict and sanctions on public health	Castori et al. (2015)	Descriptive - Analytical	Increasing sanctions have impacted the health system infrastructure over a wide range and of years and show disastrous effects on people's health in the years ahead.

Title	Writers	Procedure summary	Summary of the results
Adverse effects of political sanctions on the health care system in Iran.	Koduri et al. (2015)	Review report	Many companies and financial institutions remain reluctant to trade with Iran for fear of penalties and sanctions, and that this is likely to be affecting the importing of goods, including medicine.

### Discussion:

A search for various studies that were reviewed in the previous sections of this study showed that the sanctions have had various and different impacts on Iran's economy, as well as many other countries and consequently health systems, have suffered from severe and detrimental effects. The sanctions imposed by the superpowers and the countries with economic power in the world have different impacts. A review of numerous studies examining these impacts showed that sanctions before making international agreements, during contracts and also during the implementation of the contract cause numerous disruptions and problems that confronting them has faced the sanctioned countries with heavy and irrecoverable costs. The measures that are taken in the framework of sanctions weaken and isolate the affected countries.

Depending on the type of sanction, in terms of theme and comprehensiveness of sanctions, foundations, infrastructures, and elements of national power, the target country is being subjected to pressure, and even though these pressures are not as much as war, their detrimental effects can even exceed the war as they purposefully undermine all factors of national power ranging from economy, environment, politics, science and

technology, society, culture, military sector, and particularly healthcare.

In the present study, we examined the impacts of economic and commercial sanctions on the commercial relations of Iran and major trading partner companies during the period after the Islamic revolution of Iran. In order to investigate the purpose of the study, we examined the sanctions affecting the health system as well as the investigation of these sanctions on imports of capital medical goods and equipment. Among those works the suspension of contracts, confusion of contracting countries, dramatic increases in costs, impacts on the prolongation of project implementation, decrease in the quality of goods and services, possibility of failing to obtain quantities arising from the work and not fulfilling the objectives of the contract can be mentioned, which these impacts in some cases may result in termination or cancellation of the contracts.

Certainly, economic sanctions have always been accompanied by unwanted effects that, with no discrimination or distinction, harm military and civilian forces, especially the vulnerable groups of countries. Therefore, the security council should consider this issue. Under the international covenant on civil and political rights, no nation can be deprived of its means of



living, especially the right to health. Overall, the sanctions imposed by various countries and organizations, regarding the extent and violation of the rights of Iranian people, has violated human rights in Iran. International and unilateral sanctions against Iran have severe negative impacts on the Iranian citizens' right to health. According to the studies mentioned in the previous sections of this study, one can say that the majority of these problems and undeniable impacts are due to the sanctions of the security council and especially unilateral sanctions of the US government and the sanctions that detain international responsibility among them. According to what was said earlier, it can be stated that the right to healthcare has been identified and emphasized in various international documents. According to article 21 of the universal declaration of human rights, each individual has the right to a suitable life such as health and medical care. The World Health Organization Statute also stipulates that the use of the highest attainable standard of health without discrimination in terms of race, religion, belief, political, economic or social conditions is one of the fundamental human rights. Medicines and medical equipment are one of the obvious and essential aspects of the right to health. Unilateral and secondary sanctions imposed on many developing countries have affected the citizens' standards in those countries by their inaccessibility and inability to procure medicines needed, vital medicines and medical equipment. This is very critical and serious which should be taken into consideration, and strategies to prevent and tackle it should be sought.

#### Conclusion and Recommendations:

Since Iran has to import many of the raw materials, goods and services related to health and in the face of economic sanctions, imports of these goods under production and use will be reduced, therefore, it should be considered through policies such as incentive policies, maximum usage of domestic capacities such as foreign joint ventures so that part of the capital and intermediary goods be manufactured according to the capabilities available within the country so that the country's production capacity is not compromised. Therefore, given that in the time of economic sanctions, governments, organizations, and government-affiliated institutions and even the companies that were not government-affiliated but traded with the government and these communications have not been far from the eyes of the ones who impose sanctions, they have practically no significant activity in import and export field. Thus, establishing trade agreements with other countries, barter transactions, an increase in the quality of goods and domestic services and adjusting to the world quality to reduce imports of consumer and capital goods as well as outsourcing import and export of goods to the private sector can be a good solution.

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