

US Sanctions and Their Consequences on Orthopedic Procedures in Iran

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Abstract

Background: Sanctions have always been an obstacle for development, even in health and medical topics, since they aim to reduce a country's financial and economic power, and their impacts on medical and health systems in the objected country are inevitable. In this report, we are going to show the effect of sanctions on orthopedic surgeries in Iran.

Methods: In this study, we surveyed the opinion of 32 orthopedic surgeons about the effect of sanctions on orthopedic procedures. We evaluated surgeries routinely done in our referral centers in terms of the need for equipment and facilities.

Results: In upper limb surgeries, the high cost of equipment has more frequency between answers although, in lower limb surgeries, the changing method due to lack of facilities with worse results than the standard method has more frequency between answers. Both results indicate that sanctions made the feasibility of orthopedic surgeries more difficult.

Conclusion: We believe that several actions are needed to take place in the current situation by the international organizations to stop this unreasonable and illogical sanction, to prevent its devastating results.

Keywords: Health Services; Orthopedic Procedures; Sanctions

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Background

Access to health and medical services is considered a fundamental requirement in human societies and is one of the most primary bases of human rights. It is necessary for each country, regardless of its development rate, to provide everyone with circumstances to benefit from standard health and medical care, and all governments are required to respect and protect this right and endeavor to build foundations needed for the acquisition of specific standards in health care disciplines (1). On the other hand, the standard medical and health services depend on various factors, including financial support, access to worldwide databases and scientific knowledge, and the capability of providing up-to-date medications and instruments to improve the quality of medical care (2).

However, in today's global village, sanctions are considered a danger and obstacle on the way going through the development and prosperity of the nations, particularly on health and medical topics. Sanctions are forced not to directly target medical and health issues by spectator organizations such as the United Nations (UN) (3). In the case of Iran, although the ban appears to have focused on the economy of Iran and the government, in practice, it affected all aspects of Iranian life, including their health sector (4). On this basis, massive sanctions against Iranian financial institutions can endanger the flow of imports, since banks and foreign suppliers are ending commerce connections with Iran (4, 5). Economic sanctions are associated with increased inflation and the depreciation of the Iranian currency, which subsequently raises the price of medications and surgical instruments in Iran (6).

Therefore, it is impossible to consume and benefit

domestic products, while it would be challenging to obtain necessary and sufficient standards. Thus, an inevitable effect of the economic sanctions is that the purchase of health care supplies needs a currency transaction, which has been complicated and unstable between Iran and the developed countries.

Methods

In this study, we used a questionnaire to inquire about the effect of sanctions on orthopedic surgeries and gave it to 32 orthopedic surgeons working in a tertiary hospital in Iran. The questionnaire contained six questions including: being unable to do due to lack of facilities, failure to do due to overly expensive facilities, failure to do due to inadequate or incomplete facilities, worse results due to the use of lower quality equipment, changing of the method due to lack of facilities with worse results than the standard method, and changing of the method due to lack of facilities with same results as the standard method. We evaluated surgeries which are routinely done in our referral centers and need equipment and facilities. In our survey, we divided the subspecialty of orthopedic procedures into four groups, as shown in table 1.

Results

As shown in figure 1, in upper limb surgeries, high cost of equipment has more frequency between answers, although in lower limb surgeries, changing of method due to lack of facilities with worse results than standard method has more frequency between answers. Both results indicate that sanction made the feasibility of orthopedic surgeries more difficult (Figure 1).



Specialty	Number of surgeons	Surgeries
Lower limb (hip, knee, and ankle surgeons)	11	Bipolar hip arthroplasty
		Total hip arthroplasty primary (routine)
		Total hip arthroplasty primary (difficult)
		Total hip arthroplasty revision
		Total knee arthroplasty primary (routine)
		Total knee arthroplasty primary (difficult)
		Total knee arthroplasty revision
		C-clamp for pelvic fracture
		Specific proximal femur nails
		Retrograde nail
		IM lengthening device
Upper limb (hand and shoulder surgeons)	6	Radial head arthroplasty
		MP arthroplasty
		IP arthroplasty
		Hunter rod of tendon
		Nerve and tendon repair and reconstruction
		Wrist arthroplasty
Pediatric (pediatric and spine surgeons)	7	Elbow arthroplasty
		Shoulder arthroplasty
		Different size of hook plate
		Pediatric DHS, DCS plates
		Ilizarov insertion
		TSF insertion
		Growing rod for spine
Common *	24	Anatomical plate for fracture and osteotomy
		Bioabsorbable pin and plate
		Suture anchor insertion
		Custom made arthroplasty
		Routine plate, IM nail
		Headless screw
		Allograft

*Surgeries done by upper limb, lower limb, and pediatric surgeons
 MP: Metacarpophalangeal; IP: Interphalangeal; DHS: Dynamic hip screw; DCS: Dynamic condylar screw; TSF: Taylor spatial frame; IM: Intramedullary

Discussion

One of the most definite manifestations of the effects of the new United States (US) sanctions can be seen in the anxiety of orthopedic surgeons. The authorities are deeply

concerned about the provision of essential surgical instruments and prostheses, since their importing has been ceased through terminating the cooperation of international companies and banks with Iranian importers (7).

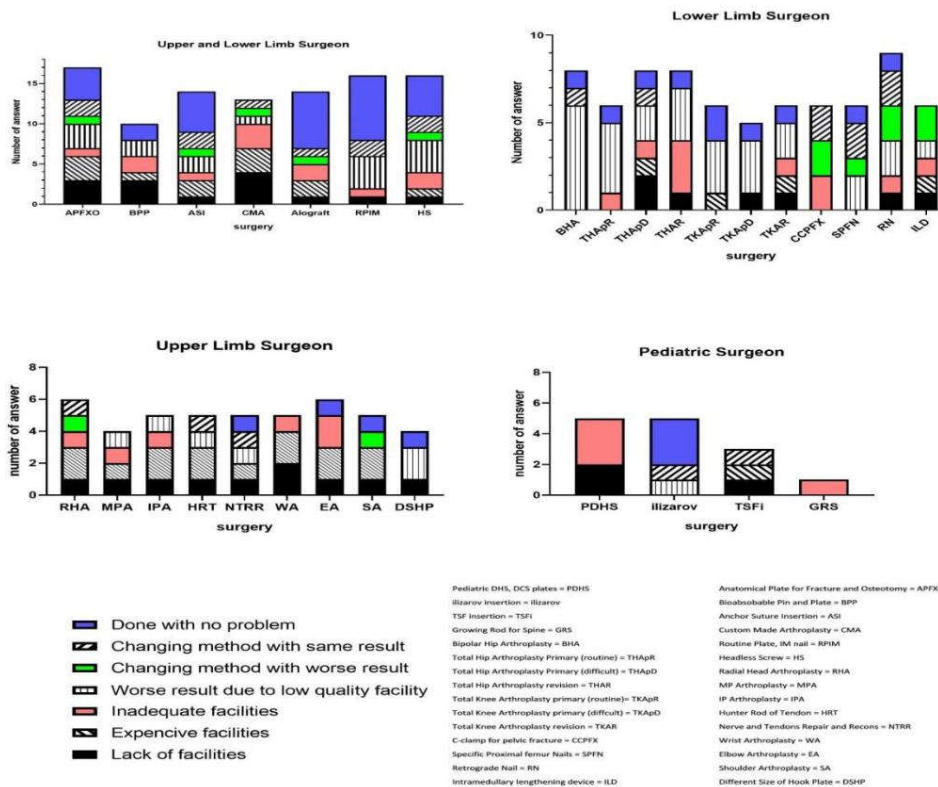


Figure 1. The survey among tertiary care orthopedic surgeons in Tehran, Iran, shows the effects of the sanctions on the feasibility of the most common orthopedic surgeries. The Y axis is the number of surgeons, and the X axis is the type of procedure. For each type of surgery, each surgeon selected only one answer from the seven choices provided regarding the procedure's feasibility. MP: Metacarpophalangeal; IP: Interphalangeal; IM: Intramedullary; DHS: Dynamic hip screw; DCS: Dynamic condylar screw; TSF: Taylor spatial frame

On the other hand, several actions have been taken after sanction application to diminish the sanctions' effects and neutralize their destroying and catastrophic consequences in Iran. However, the unfair and unacceptable nature of the sanction is undebatable and undeniable. On this basis, several scientists, clinicians, and experts have developed and introduced novel surgical techniques and unique modifications to current gold standards, not only to make procedures feasible and affordable without specific instruments but also to support patients to suffer least from the disastrous effects of the illogical and unacceptable sanctions.

During recent years, Iranian orthopedic surgeons tried to adjust to the latest and novel surgical techniques and materials, not only to have concurrency with international standards but also to decrease postoperative complications of the patients and improve the surgical outcomes. Besides, our result showed that in upper limb surgeries, the high cost of equipment had more answers between questions, although in lower limb surgeries, changing of the method due to lack of facilities with worse results than standard method had more frequency between answers. Both results indicate that sanctions made the feasibility of orthopedic surgeons more difficult (Figure 1).

However, recent studies and randomized clinical trials carried out in Iran were primarily aimed to discuss and compare the advantages and disadvantages of the new instruments, prostheses, and materials with conventional techniques and methods. Previously, Iranian surgeons have announced several novel techniques in the literature in order to replace the western instruments with domestic instruments or alternative techniques to provide better outcomes in various clinical cases, which have always been challenging for all physicians worldwide, such as humerus fracture treatment, distal humerus bone graft, radius fractures, femoral fractures, etc. (8-13). For instance, an Iranian study was carried out on patients who suffered from complex distal humerus fracture, and authors used Kirschner wires (K-wires) to reconstruct and restabilize the surface of the bone (11, 14).

However, considering the application of the sanctions, these products will not be accessible and easy-to-afford for Iranian patients, which might lead to less safety and more complications among patients, and they will be obstructed from receiving the best cure for their diseases. Moreover, this dilemma will deter surgeons from future studies on new topics in Iran that can significantly harm the scientific community and scientists.

Conclusion

Many medications and medical devices are unavailable in the Iranian market, do not hold the same quality, or are not affordable due to the decrease of Iranian's currency value; and the majority of the patients are currently struggling with the side effects of alternative procedures and scenarios

Conflict of Interest

The authors declare no conflict of interest in this study.

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References

- DiLorenzo T. From Pathology to Politics: Public Health in America. London, UK: Routledge; 2017.
- Kayyali B, Knott D, Kuiken SV. The 'big data' revolution in healthcare: Accelerating value and innovation [Online]. [cited 2013 Apr 1]; Available from: URL: <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/the-big-data-revolution-in-us-health-care>
- Kokabisaghi F. Assessment of the effects of economic sanctions on Iranians' right to health by using human rights impact assessment tool: A systematic review. *Int J Health Policy Manag.* 2018;7(5):374-93. doi: 10.15171/ijhpm.2017.147. [PubMed: 29764102]. [PubMed Central: PMC5953521].
- U.S. Department of the Treasury. Sanctions Programs and Country Information, Iran Sanction [Online]. [cited 2019]; Available from: URL: <https://home.treasury.gov/policy-issues/financial-sanctions/sanctions-programs-and-country-information>
- Katzman K, Kerr PK. Iran nuclear agreement. Washington, DC: Congressional Research Service; 2016.
- Petrescu IM. The effects of economic sanctions on the informal economy. *Management Dynamics in the Knowledge Economy.* 2016;4(4):623-48
- Langer A, Schroder-Back P, Brink A, Eurich J. The agency problem and medical acting: An example of applying economic theory to medical ethics. *Med Health Care Philos.* 2009;12(1):99-108. doi: 10.1007/s11019-008-9138-y. [PubMed: 18470634].
- Omidi-Kashani F. Pedicle subtraction osteotomy in a 5-year-old child with congenital kyphosis. *Arch Bone Jt Surg.* 2015;3(3):204-6. [PubMed: 26213705]. [PubMed Central: PMC4507075].
- Aslani H, Panjavy B, Bashy RH, Tabrizi A, Nazari B. The efficacy and complications of 2-hole 3.5 mm reconstruction plates and 4 mm noncanulated cancellous screws for temporary hemiepiphysiodesis around the knee. *J Pediatr Orthop.* 2014;34(4):462-6. doi:10.1097/BPO.0000000000000115. [PubMed: 24172669].
- Kamrani RS, Farhadi L, Farhoud AR. Forearm as a valuable source of vascularized bone graft for the distal humerus. *J Shoulder Elbow Surg.* 2018;27(3):435-43. doi: 10.1016/j.jse.2017.09.018. [PubMed: 29248257].
- Kamrani RS, Mehrpour SR, Aghamirsalim MR, Sorbi R, Zargar BR, Kaya A. Pin and plate fixation in complex distal humerus fractures: Surgical technique and results. *Int Orthop.* 2012;36(4):839-44. doi: 10.1007/s00264-011-1343-2. [PubMed: 21881883]. [PubMed Central: PMC3311817].
- Bahari-Kashani M, Taraz-Jamshidy MH, Rahimi H, Ashraf H, Mirkazemy M, Fatehi A, et al. Outcomes of pin and plaster versus locking plate in distal radius intraarticular fractures. *Trauma Mon.* 2013;17(4):380-5. doi: 10.5812/traumamon.7951. [PubMed: 24350132]. [PubMed Central: PMC3860657].
- Fakoor M, Mousavi S, Javherizadeh H. Different types of femoral shaft fracture; different types of treatment: Their effects on postoperative lower limb discrepancy. *Pol Przegl Chir.* 2011;83(9):477-81. doi: 10.2478/v10035-011-0074-9. [PubMed: 22166735].
- Mazhar FN, Ebrahimi H, Jafari D, Mirzaei A. Radial head resection versus prosthetic arthroplasty in terrible triad injury: A retrospective comparative cohort study: A retrospective comparative cohort study. *Bone Joint J.* 2018;100-B(11):1499-505. doi: 10.1302/0301-620X.100B11.BJJ-2018-0293.R1. [PubMed: 30418065].