

#### Research

# Unveiling the True Price: Assessing the Economic Impact of Cosmetic Surgery Tourism on a Single Tertiary Center in Bahrain

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Aesthetic Surgery Journal Open Forum 2024, ojae099 Editorial Decision date: October 17, 2024; online publish-ahead-of-print November 1, 2024. © The Author(s) 2024. Published by Oxford University Press on behalf of The Aesthetic Society.

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#### **Abstract**

Background: In light of the escalating cost of cosmetic surgery in Bahrain, the burgeoning "Cosmetic Surgely NouriBh" Sector 485 captured the attention of many Bahrainis. Neighboring countries aggressively promote affordable packages on numerous social media platforms, luring individuals with the allure of a vacation experience. However, insufficient postoperative care abroad has far-reaching implications that jeopardize both patient well-being and the integrity of the healthcare system.

**Objectives:** This study aims to assess the present patterns of complications related to cosmetic surgery tourism and the resulting financial burden on the Bahraini healthcare system.

**Methods:** A retrospective cost analysis and chart review were performed for all patients who presented with complaints associated with cosmetic surgeries between January 2018 and September 2023. After identifying patient demographics, procedure characteristics, admission data, length of stay, and intervention needs, a comprehensive cost analysis was conducted.

**Results:** A total of 30 patients manifested complications. The complications associated with abdominoplasty were the most prevalent. Iran emerged as the most frequented destination, with Egypt and Turkey following in order of prevalence. Surgical-site infections constituted the most common complications. Required interventions included admission for intravenous antibiotics, hyperbaric wound care, implant removal, and critical care admission. The projected expense to the hospital was 65,970 BHD (175,000 USD), equating to an average expenditure of 2200 BHD (5852 USD) per patient.

**Conclusions:** The allure of cost-effective cosmetic treatments often leads to complications that impose substantial economic burdens. The study concludes with policy recommendations to balance individuals' freedom to seek healthcare abroad with long-term sustainability and equitable access to Bahrain's healthcare system.

#### **Level of Evidence: 5 (Risk)**

Cosmetic surgery tourism, or "Alsiyaha Al-Tajmilia" as it is colloquially known, is a thriving global phenomenon describing the practice of patients traveling abroad to seek aesthetic surgery. Once considered a luxury for the wealthy, it has now penetrated various levels of society. Historically, medical tourism catered to an affluent clientele seeking advanced technologies and world-class medical expertise unavailable in their home countries. However, recent trends show reciprocal movements tempted by the strong desire to align with contemporary standards of beauty influenced by social media figures. An estimated 15 million US citizens seek medical care abroad every year, and over 60,000 patients travel out of the United Kingdom for medical tourism, according to the British Association of Aesthetic Plastic Surgeons. 1.2

As domestic cosmetic surgery prices soar—because of excessive demand, advancements in medical technology, and a growing acceptance of body modification—many Bahrainis seek cosmetic surgeries in neighboring countries, enchanted by a "holiday

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experience." These destinations offer numerous choices in the cosmetic surgery tourism market through packages that encompass affordable procedures with deluxe accommodations, fulfilling an extended form of vacation. Miyagi et al reported substantial savings in cosmetic procedural costs, reaching up to 90% off the domestic price in the United Kingdom. The allure of affordable packages, shorter waiting times, discounted airfare, and the opportunity to maintain privacy has led many Bahrainis to seek cosmetic surgeries abroad, where they can undergo procedures anonymously without the knowledge of their local communities.

While abroad, financially strained patients may self-discharge prematurely, risking complications during the critical postoperative period and increasing the danger of blood clots from long flights home. In 1 case, Tran et al reported that a young woman had multiple cosmetic procedures done in Mexico for under \$5000, but complications ballooned the total cost of her care to over \$77,000.

Despite the initial prospects, cosmetic surgery tourism is linked with high complication rates related to limited preoperative counseling, lenient patient selection, inadequate postoperative care, and language barriers. Regrettably, many patients return home carrying serious ramifications related to these procedures. Complications can vary in presentation, ranging from wound infection to fulminant sepsis and death, ultimately landing in the hands of local plastic surgeons. An estimated fatality rate associated with cosmetic surgery is 1 in 55,000, whereas the rate of death associated with gluteal fat grafting is 1 in 3448.

This study employs a mixed methods approach, examining data over the past 5 years to elucidate the financial toll of cosmetic surgery tourism in Bahrain. Understanding its full consequences is crucial for healthcare policymakers, medical professionals, and the public to implement guidelines and regulations to safeguard patients considering overseas aesthetic surgeries. This study aims to fill existing gaps in the literature and offers actionable insights for a more sustainable healthcare ecosystem in Bahrain.

#### **METHODS**

The institutional review board at the Royal Medical Services of Bahrain granted permission to perform a retrospective chart review and cost analysis of all patients treated at King Hamad University Hospital over 5 years.

#### **Data Collection**

Data for this study was collected retrospectively from King Hamad University Hospital in Bahrain, a leading tertiary medical center with a catchment population of 264,000. The study included all patients aged 18 or older residing in Bahrain who underwent cosmetic procedures abroad and presented to the hospital between January 2018 and September 2023. Only patients who were admitted and presented to the plastic surgery clinic with complications from cosmetic surgeries were included. Patients who underwent dental, bariatric, ENT, and orthopedic surgeries were excluded.

#### **Variables**

Charts were individually reviewed by the plastic surgery team overseeing the care of the patients. A specialized pro forma was designed to collect the following data:

- Patient demographics: age, gender, BMI, and underlying comorbidities
- Details of the cosmetic procedure: country visited, and type of procedure
- Admission data: length of stay, treatments provided, and critical care admission

### **Cost Analysis**

The cost for each patient was calculated using the hospital's pricing for inpatients and outpatients provided by the finance department. Costs included in the analysis pertain solely to the management of complications from original surgeries and do not encompass any secondary aesthetic procedures aimed at correcting these issues.

Costs considered included:

- · Inpatient length of stay
- · Critical care admission and duration
- · Special dressings, antibiotics, and additional surgeries performed
- · Specialist care consultations
- Intravenous infusions including blood transfusions and medications
- · Hyperbaric care and negative pressure wound therapy
- · All plastic surgery outpatient consultations and follow-up

#### **Statistical Methods**

Quantitative data analysis was conducted using SPSS version 28 (IBM, Armonk, NY). Descriptive statistics were used to summarize the demographics and types of surgeries, whereas inferential statistics, including  $\chi^2$  tests and logistic regression, were employed to investigate the relationships between variables. Additionally, a cost analysis was performed to quantify the economic burden on the Bahraini healthcare system. For qualitative data, thematic analysis was employed to explore the social impacts on patients.

#### **RESULTS**

Thirty patients were encountered during the 5 years between January 2018 and September 2023. Most patients in the dataset were women, making up 93.3% (28 out of 30) of the cases, whereas males accounted for only 6.7% (2 out of 30).

The patients' ages ranged from 23 to 61 years, with an average age of  $\sim$ 41.9 years and a standard deviation of 11.0 years. The mean BMI was  $\sim$ 31.4 kg/m² (range, 20.4-48.0). BMI calculations included 27 out of 30 patients because it was not recorded during the hospital visits for 3 patients. Five out of 30 patients had a history of diabetes and hypertension. One patient had undergone open-heart surgery with valve replacement, and 2 had psychological illnesses, including depression and anxiety disorder, for which they were receiving active treatment. Smoking history was positive in 4 patients (n = 4, 13.3%; Table 1).

A total of 41 surgeries were performed among the 30 patients. The patients underwent a diverse range of surgeries. Out of the 30 patients, 16 patients (53.3%) underwent single surgery, whereas 14 patients (46.7%) underwent multiple surgeries in the same setting. The most common procedure was abdominoplasty, with 15 cases accounting for  $\sim$ 36.6% of the total surgeries. This was followed by lipoabdominoplasty, which had 6 cases, making up 14.6% of all

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 $\begin{tabular}{ll} \textbf{Table 1.} Sociodemographic Characteristics of the Participants \\ (Total = 30) \end{tabular}$ 

Characteristics	Statistics
Age in years	
Mean ± SD	41.9 ± 11.0
Range	23.0-61.0
BMI in kg/m <sup>2</sup>	
Mean ± SD	31.4 ± 6.8
Range	20.4-48.0
Gender, n (%)	
Male	2 (6.7)
Female	28 (93.3)
Smoking <sup>a</sup> , n (%)	
Yes	4 (16.0)
No	21 (84.0)
Comorbidities, n (%)	
Diabetes miletus	5 (16.7)
Hypertension	5 (16.7)
Open-heart surgery with valve replacement	1 (3.3)
Psychological illnesses	2 (6.7)
Country of original surgery, n (%)	
Iran	8 (26.7)
Egypt	6 (20.0)
Turkey	4 (13.3)
India	3 (10.0)
Jordon	2 (6.7)
Saudi Arabia	2 (6.7)
Syria	2 (6.7)
Tunisia	1 (3.3)
Scotland	1 (3.3)
Unknown destination	1 (3.3)

SD, standard deviation. <sup>a</sup>Number of missing = 5.

surgeries. Breast augmentation and reduction mammoplasty were the next most frequent, with 4 instances of the former and 3 cases of the latter, representing 9.8% and 7.3%, respectively. Other surgeries like liposuction of the abdomen, thighs, and arms; blepharoplasty; brachioplasty; facelift; and fat grafting of the buttocks were performed twice each, each contributing 4.9% of the total surgeries. Thigh lift, repair of ectropion, and gluteal implant each accounted for 2.4% (Table 2).

Table 2. Breakdown of Cosmetic Procedures Abroad

Characteristics	Statistics
Patients with cosmetic surgeries, n (%)	(Total = 30)
Single surgery	16 (53.3)
Combined surgeries	14 (46.7)
Total number of cosmetic surgeries, n (%)	(Total = 41)
Abdominoplasty	15 (36.6)
Lipoabdominoplasty	6 (14.6)
Breast augmentation	4 (9.8)
Reduction mammoplasty	3 (7.3)
Liposuction of the abdomen, thighs, and arms	2 (4.9)
Blepharoplasty	2 (4.9)
Brachioplasty	2 (4.9)
Facelift	2 (4.9)
Fat grafting of the buttocks	2 (4.9)
Thigh lift	1 (2.4)
Repair of ectropion	1 (2.4)
Gluteal implant	1 (2.4)
Combined surgeries, n (%)	(Total = 14)
Abdominoplasty with reduction mammoplasty	2 (14.3)
Liposuction of arm, thigh, abdomen arm with fat transfer	2 (14.3)
Lipoabdominoplasty with breast reduction	1 (7.1)
Lipoabdominoplasty with abdominal wall hernia	1 (7.1)
Abdominoplasty with fat transfer	1 (7.1)
Abdominoplasty, breast augmentation, and thigh lift	1 (7.1)
Abdominoplasty with breast augmentation	1 (7.1)
Abdominoplasty with blepharoplasty	1 (7.1)
Abdominoplasty with brachioplasty	1 (7.1)
Lipoabdominoplasty and fat transfer	1 (7.1)
Lipoabdominoplasty with brachioplasty	1 (7.1)
Face lift with blepharoplasty	1 (7.1)

# **Categories of Presentations and Their Frequencies**

Regarding patient presentation, the most frequent complaint was fever and discharge, observed in 10 patients (33.3% of the sample). This was followed by a wound infection, affecting 7 patients (23.3%). Pain was the primary symptom for 6 patients (20.0%), whereas anemia and septic shock were less common, affecting 2 (6.7%) and 1 (3.3%)

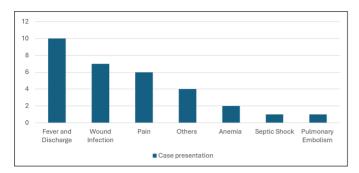


Figure 1. Presentation of complications from cosmetic surgery tourism.

patient, respectively. The remaining 4 patients (13.3%) presented with other symptoms not categorized here. Table 4 lists the most common organisms detected in patients who suffered from wound infections.

The chart reveals that surgical-site infection and wound issues are the most common complications, each accounting for roughly a third of the total cases. Lesser but significant presentations relate to pain, discomfort, and organ-specific issues (Figure 1).

- · Total complications: 34
- Fever and discharge were the most frequent symptoms, accounting for 29.4% (n = 10 out of 34) of all presentations. This category refers to fevers and drainage but is not necessarily confirmed as a wound infection
- Wound infections were confirmed in 20.6% (n=7) of the complications
- Pain that was prolonged was noted in 17.6% (n = 6)
- The remaining 32.4% (11 out of 34) of complications included various less-frequent symptoms, such as septic shock, bleeding and discharge, nausea and pain, vomiting and weakness, nipple—areolar necrosis, implant rupture, anemia, dehiscence with exposed bone, hypoxia and hypotension, acute pancreatitis with sepsis, facial swelling, eye swelling, thigh pain, and abdominal wall hematoma. Each of these less-frequent complications contributed individually to a smaller percentage of the total presentations (Table 3).

## **Statistical Analysis**

Descriptive statistics were employed to summarize the demographic details, types of complications, and interventions. The length of hospital stays was analyzed using both mean and median measures.

Upon examining the data, there was no apparent gender-based discrepancy in the complications observed among patients who underwent cosmetic surgery abroad. Both males and females exhibited similar patterns of complications, as indicated by a  $\chi^2$  statistic of 1.87 and a P-value of .39, suggesting no statistically significant association between gender and the types of complications in this sample.

Looking into the relationship between age and complications, the data revealed that patients experiencing complications had an average age of around 41.9 years, with a median age of 43.5 years. A standard deviation of  $\sim$ 10.8 indicates a moderate dispersion of ages around the mean. Furthermore, the age distribution appeared symmetric, with a skewness of -0.07, and lacked significant outliers, as evidenced by a kurtosis value of -1.09. The age range of patients

**Table 3.** Breakdown of Each Surgery With its Complications (Total = 34)

(Total = 34)	
Cosmetic surgery	Complications
Abdominoplasty	Septic shock
Abdominoplasty	Wound gaping
Abdominoplasty with reduction mammoplasty	Wound infection
Abdominoplasty	Discharge and wound gapping
Abdominoplasty with reduction mammoplasty	Fever, discharge, and wound infection
Lipoabdominoplasty with abdominal wall hernia with mesh	Pain, fever, discharge, and wound infection
Abdominoplasty with fat transfer	Pain, fever, and discharge
Abdominoplasty	Fever, weakness, and vomiting
Reduction mammoplasty	Nipple areolar complex necrosis
Gluteal implant augmentation	Implant rupture
Lipoabdominoplasty with breast reduction	Pain and discharge
Abdominoplasty	Fever and wound infection
Breast augmentation	Pain and discharge
Breast augmentation, abdominoplasty, and thigh lift	Fever and discharge
Liposuction arm, abdomen arm with fat transfer	Pain and wound infection
Abdominoplasty with breast augmentation	Pain and discharge
Liposuction arm, abdomen arm with fat transfer	Fever and anemia
Lipoabdominoplasty	Fever, discharge, and wound infection
Abdominoplasty with brachioplasty	Fever, discharge, and wound infection
Abdominoplasty	Thigh pain
Abdominoplasty with blepharoplasty	Anemia (abdominal wall hematoma)
Repair of ectropion	Wound gapping with exposed bone
Abdominoplasty	Wound gapping
Lipoabdominoplasty with brachioplasty and liposuction	Pulmonary embolism with obstructive shock
Lipoabdominoplasty and fat transfer	Anemia, acute pancreatitis, and sepsis
Breast augmentation	Implant rupture
Abdominoplasty	Redo, cosmetic dissatisfaction
Lipoabdominoplasty	Wound infection and seroma
Face lift	Face swelling

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Table 4. Most Common Organisms Causing Wound Infection

Pseudomonas aeruginosa

Serratia marcescens

Escherichia coli

Citrobacter koseri

Klebsiella pneumoniae

Methicillin-resistant Staphylococcus aureus

Corynebacterium jeikeium

Mycobacterium tuberculosis

spanned from  $\sim$ 23 to 61 years, exhibiting a somewhat bimodal trend with peaks in the late 30 s and mid-50 s. Notably, there was a discernible dip in frequency within the 40 to 45 years range.

#### **DISCUSSION**

Cosmetic surgery tourism is thriving relentlessly, with an annual market value exceeding \$100 billion. A VISA and Oxford Economics review forecasted that the medical travel market will reach \$3 trillion by 2025. The authors of studies from the United States report that South America—including Mexico, the Dominican Republic, and the Caribbean—is among the most popular destinations, whereas Europe and Turkey are notable destinations for patients from the United Kingdom. In our review, Iran and Egypt ranked as the most visited destinations, perhaps because of patients' ethnic backgrounds or geographical proximity, suggesting that location influences patient choices.

The main driving force fueling this practice is cost reduction. Castonguay and Brown established that considerably lower initial costs are the primary reason for traveling abroad. This reduction of cost overshadows potential long-term risks. This sentiment is reiterated by Melendez and Alizadeh, who conducted a 15-question survey distributed to 2000 active American Society of Plastic Surgery members concerning their experience treating cosmetic tourist complications. The report found that 83.9% of responders reported treating complications for patients who had undergone cosmetic procedures by nonplastic surgeons. 12

Our study highlights several critical points related to these economic implications. Firstly, complications appear across surgeries from multiple countries, suggesting that the risk of complications is not isolated to a particular geographic location. This is important for the Bahraini healthcare system, because it implies that the burden from complications stemming from cosmetic surgery tourism may be widespread and not confined to surgeries from specific countries.

Secondly, some countries have a higher frequency of certain types of complications, such as septic shock or wound infections. In our review, we detected different types of microorganisms isolated from wounds, as demonstrated in Table 4; however, identifying *Mycobacterium tuberculosis* in the wound bed was striking. Lenient regulations and insufficient sterilization techniques of surgical equipment place patients in danger of acquiring infections, causing unexpected financial burdens. Maurer and colleagues reported rapidly growing mycobacterial infections in 7 previously

healthy women who underwent cosmetic surgeries in Latin America.<sup>13</sup> These infections are particularly demanding because they require a protracted course of therapy with complex antibiotic regimens, multiple hospital admissions, and are associated with significant morbidity.

In a study, Gilardi and colleagues highlighted a significant instance of *Candida albicans* necrotizing fasciitis in an immunocompetent young woman following breast augmentation mastopexy and gluteal fat grafting in Italy. This case was managed with aggressive surgical debridement and antifungal therapy. <sup>14</sup> In their subsequent systematic review, Gilardi et al emphasized the prevalence of infectious complications associated with cosmetic procedures in medical tourism contexts. <sup>15</sup> This review provided a comprehensive overview of the epidemiology and clinical outcomes linked to such complications, reinforcing the necessity for stringent safety measures and regulatory oversight within the industry. The evidence presented aligns with our findings, indicating that patients traveling for cosmetic surgery are at increased risk of serious infections, which can lead to significant morbidity and additional healthcare costs.

Furthermore, the Centers for Disease Control and Prevention and the US State Department have issued alerts warning citizens against traveling to the Dominican Republic because of the high incidence of rare infections and deaths associated with plastic surgery. <sup>16,17</sup> In this context, Jobson and Freckelton underscore the evolving knowledge and awareness surrounding the perils of cosmetic surgery tourism. <sup>18</sup> In their work, they highlight the multifaceted challenges faced by patients seeking procedures abroad, reinforcing the urgent need for comprehensive education regarding the potential risks involved. Although our data do not provide sufficient context to establish causality, they present avenues for further investigation. Future research could explore whether specific complications are tied to particular surgical procedures, healthcare standards, or other variables present in these countries.

Lastly, the diversity of presentation types indicates that the complications are not uniform but range from less severe issues like fevers to more serious conditions like septic shock. This diversity could have varying impacts on the healthcare system in Bahrain in terms of treatment complexity and costs. The economic implications of these complications extend beyond immediate healthcare costs, impacting both patients and local healthcare systems.

The practice of cosmetic surgery tourism has not faltered even during the COVID-19 pandemic, despite global restrictions and the death toll. The European Association of Societies of Aesthetic Plastic Surgery advised the immediate suspension of cosmetic surgery to allocate and redirect resources to overcome the pandemic. <sup>19</sup> Lack of awareness of high-risk behavior amid the global pandemic led 7 patients to undergo cosmetic surgery abroad between 2020 and 2021, overlooking postoperative pulmonary complications and higher mortality rates. <sup>20</sup>

The Islamic Republic of Iran has emerged as a focal point for surgeries associated with complications, accounting for ~23.3% of all recorded cases with 7 incidents. The complications reported ranged from wound infections to more severe conditions such as pulmonary embolism and death, highlighting Iran's significant contribution to the healthcare burden in Bahrain related to cosmetic surgery tourism. However, these findings should be interpreted cautiously. Despite Iran's highest recorded rate of complications in this dataset, limitations such as sample size and data quality must be considered.

Additionally, the economic impact of these complications, including the costs related to their treatment, cannot be overlooked and warrants further investigation in future research.

A comprehensive approach is needed to enhance patient safety and improve the quality of cosmetic tourism experiences. Firstly, implementing pretravel counseling programs is crucial, ensuring that potential tourists are well informed about the risks associated with medical travel. Evidence suggests that such educational initiatives can significantly reduce the incidence of complications and improve patient outcomes.<sup>21</sup>

Secondly, stricter regulations for medical tourism agencies are essential to guarantee transparency regarding the accreditation and standards of healthcare facilities abroad, aligning them with Bahrain's quality benchmarks. Professional medical organizations, in collaboration with government health departments, should oversee these accreditation processes to ensure compliance with established standards.

Thirdly, establishing a monitoring body overseen by the government would track outcomes and complication rates, providing valuable data for future policymaking and patient decision making. This responsibility should be shared among healthcare providers, regulatory agencies, and medical tourism organizations to ensure that patients receive accurate information and support throughout their journey.

Investing in domestic cosmetic surgery infrastructure would bolster local competitiveness and reduce reliance on international markets. Furthermore, developing a postreturn medical support framework is vital, offering patients follow-up care and intervention strategies to manage complications effectively, safeguarding their long-term health. By integrating these policies, Bahrain can enhance its services and position itself as a desirable destination for cosmetic surgery while prioritizing patient safety and well-being.

Future research should include a larger, more diverse dataset to corroborate these initial observations. The current data suggest that geographic variations in complication rates exist, emphasizing the need for further investigation to understand their implications for healthcare systems like Bahrain's.

This study has several limitations, including its retrospective design, a relatively modest sample size, and the absence of medical records from foreign healthcare providers. Moreover, the study does not capture the full scope of Bahraini patients seeking cosmetic procedures abroad, focusing solely on those who presented with complications at local tertiary referral centers. The research also lacks data on the number of patients who might be satisfied with their overseas surgeries and do not seek follow-up care upon returning to Bahrain.

#### **CONCLUSIONS**

Our study elucidates the significant economic and health implications associated with cosmetic surgery tourism, particularly in relation to complications arising from procedures conducted abroad. The findings underscore the pressing need for enhanced patient education and awareness regarding the risks linked to pursuing cosmetic surgeries outside of one's home country. Subsequent to the submission of this study, additional research has corroborated our findings, thereby reinforcing the critical importance of this investigation within the context of Bahrain's healthcare system.

To mitigate these risks, we advocate for the implementation of comprehensive pretravel counseling programs, the establishment of clear accreditation standards for medical tourism facilities, and the fostering of collaboration among healthcare providers, regulatory bodies, and medical tourism agencies. Furthermore, cooperative efforts between Bahraini medical societies and their international counterparts are essential for the formulation and continuous updating of safety standards, which are crucial for safeguarding patient well-being in light of the ongoing globalization of healthcare. By prioritizing patient safety, we can enhance the quality of care for individuals seeking cosmetic procedures abroad and effectively reduce the burden of complications on local healthcare systems.

#### **Disclosures**

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

#### **Funding**

The authors received no financial support for the research, authorship, and publication of this article, including payment of the article processing charge.

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