LESS

Original Article

Laparosc Endosc Surg Sci 2016;23(1):6-14
DOI: 10.14744/less.2013.35220

Evaluation of treatment, approach, and surgical instrument preferences among surgeons: A survey

Göksin Özel,[1] Güvenç Koçkaya,[1] Sultan Özcan,[1] Hülya Tiner,[1] Hakan Karadağ,[2] Ruhi Kadaifci,[3] Yıldırım Gülhan[4]

[1]Covidien, Istanbul, Turkey
[2]Department of Pharmacology, Trakya University Faculty of Medicine, Edirne, Turkey
[3]Medvice Medical Consultancy, Istanbul, Turkey
[4]Department of Health Management, Okan University Faculty of Economics and Administrative Sciences, Istanbul, Turkey

ABSTRACT

Introduction: The aim of this study was to evaluate daily practice among a population of surgeons.

Materials and Methods: A questionnaire was distributed to randomly selected general surgeons, gynecologists, urologists, and thoracic surgeons from the following 12 cities: Adana, Ankara, Antalya, Bursa, Diyarbakir, Erzurum, Istanbul, Izmir, Kayseri, Manisa, Mersin, and Samsun.

Results: Surgeons administer deep vein thrombosis prophylaxis in 65% of their patients. Laparoscopic surgery is the most frequently performed procedure for cholelithiasis and antireflux treatment. The dominant factor in the selection of new surgical device is cost-effectiveness. There is an increasing preference for single-port laparoscopy. The impact of surgeons on purchase of new surgical device is at most 50%.

Conclusion: This is the first survey performed in Turkey that evaluated preferences and practices of surgeons among a population that reflects practices countrywide.

Keywords: Preference; surgeon; survey; questionnaire.

Introduction

Evaluating physician practice patterns provides valuable insight into improving patient outcomes. Understanding how physicians approach patients, determine treatment methods, conduct patient referrals, adopt new treatment methods, and identify difficulties in utilizing these methods allows for the development of more effective medical technology that addresses the existing clinical needs. Evaluating physicians' clinical activities also provides a valuable picture of the general profile of the practice environment. The use of descriptive questionnaires is one method that allows for data collection in areas with a wide geographical area and sociodemographic and economic diversity. Questionnaires can be applied face-to-face or via electronic or traditional mail.[1] Unfortunately,

Received: 04.09.2013 **Accepted:** 03.12.2013
Correspondence: Güvenç Koçkaya, M.D., Covidien Saglik, Maslak Mahallesi, Bilim Sokak, No: 5, Sun Plaza, Kat: 2-3, Sisli, 34398 Istanbul, Turkey
e-mail: Guvenc.kockaya@covidien.com

questionnaire studies are not performed effectively in our country due to insufficient return, indifference, and inappropriate archiving in medicine.

Thus, academicians are reluctant to perform such questionnaire studies. In an article by Soran and Polat[2] on questionnaire studies, they reported that the response rate to an e-mail questionnaire was less than 2% among 5000 general surgeon, radiologist, medical oncologist, radiation oncologist, and pathologist members of the Federation of Breast Diseases Society, Turkish Surgery Society, Turkish Radiology Society, Medical Oncology Society, and Turkish Radiation Oncology Society.

The purpose of this study was to identify the habits and daily practices among Turkish surgeons (general surgeons, urologists, gynecologists, cardiovascular surgeons, thoracic surgeons), using face-to-face interviews.

Materials and Methods

In order to identify surgeons' practices, a quantitative questionnaire was administered to 231 randomly selected surgeons during a face-to-face interview. The study was conducted in 2010 and included physicians from Adana, Ankara, Antalya, Bursa, Diyarbakir, Erzurum, Istanbul, Izmir, Kayseri, Manisa, Mersin, and Samsun (Table 1).

The questionnaire included questions on selected diseases and medical product preferences. The study group included physicians from general surgery, gynecology, thoracic surgery, and urology. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) 13.00 software.

Results

General surgeons and thoracic surgeons were asked questions specific to the prophylactic treatment of deep vein thrombosis (DVT). Sixty-five percent of surgical patients receive some type of prophylaxis for DVT. The use of DVT prophylaxis did not differ according to the surgical specialty (65% for general surgeons and 64% for thoracic surgeons). The majority of surgeons (90% of general surgeons and 80% of thoracic surgeons) use risk assessment methods that take into account both the patient's predisposition to DVTs as well as the planned procedure before initiating prophylaxis for DVT. Surgeons employ both pharmacologic and mechanical methods in the prophylaxis of DVT. Of the surgeons who use pharmacological methods, 71% prefer administration of the prophylaxis before the operation. When the DVT prophylaxis is applied before the operation, the mean time to start prophylaxis by the surgeons is 12 hours before the operation. In the postoperative application, the mean time for starting the prophylaxis is 7 hours.

Thirty-five percent of the surgeons surveyed use mechanical methods in the prophylaxis of DVT. Of these, 30 were general surgeons and 5 were thoracic surgeons. Most of these surgeons (94%) prefer anti-embolism stockings, whereas the second most common mechanical prophylaxis method was pneumatic compression. The preference rates for bandage and early mobilization were lower.

The percentage of patients who present with a bleeding risk in the general surgery and thoracic surgery patient populations are 45% and 59%, respectively. In this case, the rate of mechanical prophylaxis use is higher among general surgeons (40%) than thoracic surgeons (22%). All of the thoracic surgeons who participated in the survey stated that they have been using prophylaxis, whereas 8% of the general surgeons stated that they do not use prophylaxis. Thoracic surgeons always use pharmacologic prophylaxis. The risk of venous thromboembolism was high in 39% of the patients among the participating surgeons. In this patient group, 76% of the surgeons use both pharmacologic and mechanical methods.

Surgeons in each of the polled disciplines were queried regarding their patients and burden of disease. The majority of the surgeons performed conventional surgery (99%), with a large percentage offering laparoscopic procedures as well (93%) (Table 2 shows the distribution of surgery

Table 1. Sample distribution

	General surgeons	Gynecologic surgeons	Thoracic surgeons	Urologic surgeons
Number of total surgeons	4800	5900	570	2600
Standard error	± 8.98	± 18.20	± 17.73	± 18.20
Sample	120	30	30	30

Table 2. Laparoscopic and open surgery rates among general surgeons according to operation types

Operation type	Laparoscopic surgery practice (%)	Open surgery practice (%)	No operation (%)
Cholecystectomy	88	55	1
Appendicectomy	43	90	5
Solid organ operations	24	81	15
Nissen fundoplication	44	29	38
Inguinal hernia	23	88	5
Umbilical/incisional hernia	28	87	9
LAR (low anterior resection)	14	68	28
Small and/or large intestine surgery	14	79	17
Rectal surgery	16	60	37
Partial or total gastric surgery	23	76	20
Gastric bypass	10	29	67
Sleeve gastrectomy	8	12	83
Gastric balloon or cuff	8	11	86

*Based on multiple selection or to the rounding up of numbers, totals may exceed 100%.

types among general surgeons). General surgeons were asked to report each operation type, numbers of patients monthly, and whether the approach was laparoscopic or open. With the exception of cholecystectomy and Nissen fundoplication, open surgical approaches were higher for all operations. The most common laparoscopic procedure was cholecystectomy, with a mean of 8 operated cases per month. Intestinal and/or colon procedures were performed predominantly using an open approach as were low anterior resection, rectal surgery, partial or total gastric surgery, and inguinal hernia (10–11%).

Thoracic surgeons were queried regarding the number of video-assisted thoracoscopic surgery (VATS) procedures performed as well as the number of open and minimally invasive approaches for each operation performed. In general, all the thoracic surgeons (100%) were proficient in open surgery. Eighty-eight percent of thoracic surgeons performed VATS procedures and 47% performed minimally invasive thoracic procedures. Almost all thoracic surgeons reported performing wedge resection, with 30% using a VATS approach. Only 29% performed esophagectomies. Lobectomy was performed primarily via an open approach. In general, the use of VATS was reported as being quite low in other operation types (range, 2–7%). The preferences of urologists according to operation type were also similar. All urologists perform nephrectomies. Other operations (radical prostatectomy and urinary tract operations) are done by most of the urologists. In this physician group, open surgery and laparoscopic surgery rates were 100% and 60%, respectively. The most common operation types among the gynecologists were myomectomy and cystectomy, with treatment of endometriosis (97%). Ninety-seven percent of gynecologists perform open surgery, with 87% able to offer laparoscopic procedures. Laparoscopic surgical approaches were more common in endometriosis, myomectomy, cystectomy, and tubal ligation (Table 3).

Factors affecting the selection of surgical products were scored on a 5-point scale from 1 (not important) to 5 (definitely very important). The most important factors in preferring a surgical product supplier were the product quality and advantage of the product for patients. A general evaluation of the factors playing a role in surgical product supplier preference is summarized in Table 4.

The most important factors in preferring a surgical product supplier were the product quality and advantage of the product for patients. On the other hand, the most important factors affecting product use were the cost, the surgeon's own clinical experience and clinical evidence (Table 5). The least significant factors were recommendations of the manufacturer (1–2%) and experience with the company (1–3%). For thoracic surgeons, clinical evidence and cost-effectiveness were the most important measures in selecting the product. The three most important measures for urologists showed small differences according to

Table 3. Preferences of thoracic surgeons, urologists and gynecologists according to operation types

Operation type	Laparoscopic surgery practice (%)	Open surgery practice (%)	No operation (%)
Thoracic surgeons			
Wedge resection	85	85	1
Segmentectomy	21	62	38
Lobectomy	29	91	9
Pneumonectomy	26	82	15
Esophagectomy	6	29	71
Urologists			
Radical prostatectomy	37	90	7
Nephrectomy	57	90	0
Urinary canal	47	93	7
Gynecologists			
Hysterectomy	77	93	7
Endometriosis	83	90	3
Ligation of tubes	67	67	13

*Based on multiple selection or to the rounding up of numbers, totals may exceed 100%.

Table 4. The factors playing a role in selection of the company for surgical products-general evaluation

Question	Not important (1-2)	Less important (3)	Moderately important	Very important (5)	Average score
Quality of products	0	1%	9%	90%	4.89
Benefits of a new surgical device for patients	0	1%	14%	84%	4.82
Cost of products to the patient	1%	3%	19%	76%	4.71
Ease of use	1%	4%	17%	77%	4.71
Credibility of the company	1%	4%	22%	73%	4.69
Price	1%	4%	21%	73%	4.65
Usage of evidence-based medicine by sales representatives	1%	5%	29%	65%	4.58
Innovative products pipeline	2%	4%	30%	63%	4.55
Broad pipeline	1%	7%	31%	59%	4.50
Additional service (education, scientific information, etc)	1%	6%	34%	58%	4.50
Technical support during the operation	1%	9%	38%	51%	4.40
Knowledge of sales representatives about products	1%	16%	36%	46%	4.27
Advice of other surgeons	2%	18%	30%	48%	4.24
Steady visits from sales representatives	2%	23%	33%	42%	4.14

*Based on multiple selection or to the rounding up of numbers, totals may exceed 100%.

the device or material. Table 6 shows the factors affecting the medical product preferences of the surgeons.

When asked to consider the benefits of a new surgical device for patients, the most important issues were reported

Table 5. The factors playing a role in selecting surgical products-evaluation based on the type of surgery (average scores)

	Thoracic surgeons	General surgeons	Urologic surgeons	Gynecologic surgeons
Quality of products	4.66	4.99	4.90	4.73
Benefits of a new surgical device for patients	4.72	4.89	4.77	4.70
Cost of products to the patient	4.44	4.79	4.73	4.63
Ease of use	4.50	4.80	4.63	4.67
Credibility of the company	4.47	4.82	4.57	4.50
Price	4.47	4.79	4.43	4.50
Usage of evidencebased medicine by sales representatives	4.59	4.62	4.43	4.53
Innovative products pipeline	4.38	4.57	4.50	4.33
Broad pipeline	4.34	4.57	4.53	4.33
Additional service (education, scientific information, etc)	4.44	4.49	4.13	4.23
Technical support during the operation	4.25	4.34	4.13	4.13
Knowledge of sales representatives about products	3.97	4.32	4.27	4.17
Advice of other surgeons	4.03	4.20	4.03	4.13
Steady visits from sales representatives	4.16	4.19	3.37	3.70

*Based on multiple selection or to the rounding up of numbers, totals may exceed 100%.

Table 6. Resterilization number of the single-use products

How many times are the single-use products resterilized?	Rate (%)
1 time	4
2–4 times	22
5 times	18
5–10 times	21
20–50 times	6
Until broken	3
No knowledge	26

*Based on multiple selection or to the rounding up of numbers, totals may exceed 100%.

as: cost-effectiveness, ease of use, and credibility of the company. Sixteen percent of surgeons rated safety as being of primary importance. When the analysis was based on surgery type, economy was seen as the most important issue for every surgeon with no difference reported between surgical disciplines. The ease-of-use parameter was reported as less important among urologists when compared to thoracic surgeons and general surgeons, while the parameter "lack of device-originated harm/fewer side effects" was found to be the most important factor among urologists. Quality did not receive a significant rating among gynecologists, though other surgeons found this parameter more significant. In addition, the "lack of harmful effects to tissues" parameter was found more significant by other surgeons when compared to general surgeons. Gynecologists considered patient compliance and clinical evidence more important compared to other surgeons.

With respect to single-use and reusable material preferences in laparoscopic surgery, 80% of the surgeons interviewed use both single-use and reusable material during laparoscopic surgery. Forty-four percent of the surgeons reported that if they had the opportunity, they would not use reusable materials in laparoscopic surgery. When asked "If it was possible, would you use [reusable materials]?", 56% of the surgeons responded "YES" and 44% "NO". When approaches were examined according to surgical discipline, reusable products were mostly refused by urologists.

The rate of surgeons using single-use products was 95%, whereas the rate of surgeons using reusable products was 68%. The question "If it was possible, would you use?" was answered with a "NO" by 50%. Eleven percent of the surgeons stated that they would not use single-use products. When approaches were examined according to surgical discipline, single-use products were mostly used

by thoracic surgeons and general surgeons. Seventy-seven percent of the surgeons reported resterilization and reuse of single-use products occurred in their hospital. Product use after sterilization was highest (83%) among general surgeons and lowest (60%) among gynecologists. The reported mean number of product sterilizations was 6.36, with 44% of the surgeons reporting sterilization of a product up to 5 times. Twenty-six percent of the surgeons surveyed had no idea about the number of sterilizations a product underwent. Resterilization numbers of single-use products are given in Table 6.

We also questioned sufficiency of package prices for certain surgical treatments on a 4-point scale: 1, definitely insufficient; 2, insufficient; 3, sufficient, and 4, definitely sufficient. Eighty-six percent of the surgeons surveyed found prices insufficient. None of the gynecologists answered "definitely sufficient", which was the highest rate for insufficient price opinion. The effect of reimbursements on surgery was evaluated on a 4-point scale as well with: 1, definitely no effect; 2, no effect; 3, some effect, and 4, strong effect. Most of the surgeons (72%) reported being affected by reimbursement rates. The most affected surgical discipline with respect to reimbursement was general surgeons, whereas the least affected was gynecologists (57%).

When the role of surgeon preference for specific products was questioned, 84% of the participants stated that the decision was made by a hospital authority, with only 16% reporting that the decision was made by the surgeon. In 66% of the responses, the hospital sought out the sur-

Table 7. The role of the surgeon in product selection

Who makes the decision regarding surgical product selection?	Total (n=214)	Thoracic surgeon (n=34)	General surgeon (n=120)	Urologic surgeon (n=30)	Gynecologic surgeon (n=30)
Decisions made by the hospital authority	84%	79%	93%	63%	77%
The hospital authority seeks the opinion of surgeons, but makes the decisions independently	66%	71%	70%	43%	70%
The hospital authority makes the decisions without involvement of the surgeons	18%	9%	23%	20%	7%
Decisions made by the surgeon	16%	21%	8%	37%	23%
The hospital authority offers the products, but the surgeon is free to decide	11%	15%	3%	27%	20%
The surgeons select the products without involvement of the hospital authority	5%	6%	4%	10%	3%
General evaluation					
Surgeons make the decision	7%	15%	4%	7%	10%
Surgeons do not make the decisions but are involved in the decision	52%	62%	52%	44%	52%
Head physician of the hospital makes the decision	11%	6%	14%	4%	7%
Head physicians of the departments make the decision	6%	12%	3%	7%	10%
Tender commission is used to make the decision	2%	0	3%	3%	1%
Hospital authority makes the decision	4%	6%	2%	11%	8%
Upper management makes the decision	4%	0	4%	0	6%
Purchasing department makes the decision	17%	7%	19%	21%	13%
Others	4%	0	2%	7%	3%

*Based on multiple selection or to the rounding up of numbers, totals may exceed 100%.

geon's opinion. The highest proportion of involvement in the decision-making process was reported by general surgeons (23%). Only 5% of the surgeons reporting made their own decision to select the product. Among the surgical disciplines, urologists had the greatest opportunity for decision-making in line with their preferences (10%). When purchasing laparoscopic equipment, surgeons made the decision directly (6%) or played an active role (54%). From that perspective, thoracic surgeons were observed to play a more active role than other surgeons (15% made their decisions on their own; 62% played an active role in the decision). The second most influential department in the purchase of laparoscopic equipment was reported as being the Purchasing Department (17%). Head physicians ranked third (11%) (Table 7).

Surgeons were asked specifically about their preference for obtaining information on products in which they are interested. Seventy percent of the responders preferred to receive information from the sales representative. Sixtytwo percent of the respondents found congresses, conferences and symposia to be important sources for new product information. Among the gynecologists, national (67%) and international (73%) publications were reported as being the most common source of information. Thoracic surgeons also reported international publications as being an important source of information (62%). When asked what expectations surgeons had of the product manufacturer, the responses differed depending on the surgical specialty. Gynecologists were interested in the presentation of the product (23%), followed by price (13%). Urologists above all wanted quality in their products (23%), followed by presentation (20%), and company support (17%). General surgeons listed price as the most important (22%), followed by educational support (12%) and congress support (11%). Thoracic surgeons cited regular calls as being the most important (21%), followed by price (18%) and presentation (18%). Overall, the leading expectation was price (19%), followed by product presentation (14%) (Table 8).

Table 8. Surgeons' expectations of medical companies-general evaluation

	Total (%)
Price	19
Nothing	15
Presentation of the products	14
Regular calls	11
Product quality	11
Congress support	11
Educational support	10
Support the need of the department	9
Information about the new products	8
Good product functioning	7
Demo products	7
Work ethics	4
Information support	4
Scientific support	3
International publications	3

*Based on multiple selection or to the rounding up of numbers, totals may exceed 100%.

Discussion

This study was based on the responses of 231 Turkish surgeons during face-to-face interviews conducted in 2010. The surgeons who participated in the study included representatives from General Surgery, Thoracic Surgery, Urology, and Gynecology. The surgeons were queried regarding the role they played in the selection and acquisition of surgical products as well as the impacts of reimbursement and of product resterilization in their practice. Specific questions pertaining to DVT prophylaxis, treatment of varicose veins, and prevalence of minimally invasive approaches in their practice were also explored during the interviews.

General and thoracic surgeons were found to apply prophylaxis against DVT in 65% of their patients. The most preferred methods of prophylaxis were mechanical and pharmacologic methods. Patient risk assessment was regularly performed by this group of surgeons. Kurtoglu and the RAISE study group,[3] in their observational study, evaluated the risk of venous thromboembolism in 1144 patients in 20 general surgery clinics throughout Turkey. The authors found that general surgeons apply prophylaxis in 83% of their patients without using any risk assessment form. In addition, they applied DVT prophylaxis in only 65% of the patients who were in the risk group. The ENDORSE Study, in which VTE risk and prophylaxis were evaluated in 358 hospitals from 32 countries, included 11 centers and 1701 patients from our country. According to the results of that study, distributions of the patients who carry VTE risk with respect to surgical or internal medicine were 64% and 23%, respectively. DVT prophylaxis was used in 39% of surgery patients and 23% of internal medicine patients.[4] Prophylaxis application and DVT risk

assessment of surgeons in our study were higher than in the ENDORSE Study, but were consistent with the results of RAISE study group,[3] which assessed DVT prophylaxis approaches of general surgeons in Turkey.

The first laparoscopic cholecystectomy was performed by a French gynecologist (P. Mouret) in 1987. In our country, this procedure was first performed by Prof. Dr. Ergun Göney in Istanbul SSK Okmeydanı Hospital in September 1990.[5] Since then, laparoscopic cholecystectomy has been performed frequently in our country. Genc et al., in their retrospective study, reported that laparoscopic procedure was the first choice in 5382 patients who underwent cholecystectomy.[6] The rate of conversion to conventional surgery was 3.16%. Conversion to conventional surgery occurs for the most part in cases in which the surgeon encounters extensive adhesions or the dissection of Calot's triangle proves to be difficult. However, laparoscopic cholecystectomy is the first choice in the surgical treatment of gallbladder disease in the absence of cancer. This was reflected in the responses of surgeons, with laparoscopic surgery selected as the first-choice treatment by 88% of the respondents. Similar results were seen for anti-reflux operations. Nissen fundoplication is not performed by 38% of the surgeons, but 44% of the surgeons performing this procedure use the laparoscopic method. Laparoscopic rectum and bowel surgery, gastric surgery, and adrenal surgery require advanced laparoscopy training. Our results suggest that laparoscopic surgery should be the preferred approach for cholecystectomy and anti-reflux surgery. Generally, laparoscopy should be used in a limited number of cases in urology and thoracic surgery since advanced laparoscopic experience is often necessary to take on these cases, and the prevalence of skilled laparoscopic surgeons in Turkey is relatively low.

When evaluating the performance of a new surgical device, the most important factor in the eyes of all the respondents was cost-effectiveness. Company selection for surgical products is based mainly on an acceptable price. Other important factors include ease of use, company credibility, clinical evidence provided by company representatives, clinical experience, free demonstration, and innovative product scale. Questions on the effects of reimbursement on surgery revealed that most of the surgeons' decisions (72%) are directly affected by insurance coverage. General surgeons were significantly more affected (78%) than the other surgical disciplines. In a dissertation entitled "Determination of service expenses of laparoscopic cholecystectomy and comparison to BUT-SUT prices", cholecystectomy expenses and reimbursement were compared to those of other countries. This dissertation was accepted in 2008 in the Baskent University Institute of Social Sciences Master of Science Program in Administration of Health Organizations.[6] It was found that the mean cost for laparoscopic cholecystectomy is 2.769 TL (2.113 USD), which cannot be offset by an additional payment of 30% by patients. In the United States, studies conducted between 1989 and 1990 showed that the same procedure costs 2-3 times more in the United States (12–16). The risk of exceeding package prices due to complications or utilizing newer technology increases the surgeon's anxiety. Anxiety of cost increase affects the preferences of surgeons.

Reuse of single-use products is very common not only in our country but also worldwide.[7–11] One of the main problems with reuse of single-use material is the proper sterilization of hollow devices and the challenge they present to achieving sterility. In a survey of 168 Australian hospitals, 64 hospitals (58%) reported that they reused medical devices. In six of the 64 hospitals, the process of sterilization was not reported to be satisfactory for reusable devices. Examination of the 14 most commonly reused devices found that the structure of 13 of the devices may compromise sterilization. The study estimates that there may be 40 cases of cross-contamination for every one million procedures performed with reused devices. Complete cessation of the practice of reusing single-use medical devices would stop potential cross-infection, but this would cost an estimated 2.5 million dollar per case prevented.[7] In our study, more than 80% of the participants used both singleuse and reused materials, with 77% of the respondents reporting a mean number of sterilizations per reused device as six. However, the surgeons stated that if given the choice, they would decrease the practice of using reuse devices. The driving force behind product reuse was reported as cost anxiety.

When asked about the role played by surgeons in product acquisition, the respondents agreed that surgeons play an important role, either as part of a group decision (52%) or as the individual solely responsible (7%).

Since the Ministry of Health instituted the Transformation in Health Program in 2002, a number of regulations have been introduced that have resulted in numerous improvements in the collection and reporting of health data. Over the last 10 years, the healthcare system in Turkey has un-

dergone significant change, and change continues to occur at a rapid rate. This survey is the first of its kind to address the impact of the changing healthcare environment on the practice patterns of surgeons in Turkey.

The limitations of the study include the small overall sample size as well as the failure to normalize the subgroups to the practicing population of general, thoracic, urologic, and gynecological surgeons. Given the rapid pace of change in the healthcare system, additional studies should be conducted to characterize the impact on practicing surgeons over time.

Acknowledgement

The study was presented as a graduate project for Master of Health Administration in Okan University by Dr. Göksin Özel. The survey for the study was sponsored by Covidien Turkey and conducted by Nielsen Turkey.

References

1. Kim HL, Hollowell CM, Patel RV, Bales GT, Clayman RV, Gerber GS. Use of new technology in endourology and laparoscopy by american urologists: internet and postal survey. Urology 2000;56:760–5.
2. Soran A, Polat AV. The thoughts of survey study. The Journal of Breast Health 2011;7:43–4.
3. Kurtoglu M; RAISE Study Group. An observational study for venous thromboembolism risk assessment among hospitalized patients in general surgery clinics across Turkey. Phlebology 2011;26:344–52.
4. Ongen G, Yılmaz A, Cirak AK, Ersoy CY, Erden F, Altıntaş F, et al. Venous thromboembolism risk and thromboprophylaxis among hospitalized patients: data from the Turkish arm of the ENDORSE study. Clin Appl Thromb Hemost 2011;17:539–45.
5. Göney E. History of endoscopic (laparoscopic) surgery. T Clin Jour Med Sci 1994;14:79–86.
6. Eminsoy MG. Determine the service cost of laparoscopic cholecystectomy from the package operations and compate the BUTSUT prices. Master Distertation, Baskent University Social Science Institutes, Management of Health Agencies, Ankara, 2008.
7. Collignon PJ, Graham E, Dreimanis DE. Reuse in sterile sites of single-use medical devices: how common is this in Australia? Med J Aust 1996;164:533–6.
8. Kozarek RA, Raltz SL, Ball TJ, Patterson DJ, Brandabur JJ. Reuse of disposable sphincterotomes for diagnostic and therapeutic ERCP: a one-year prospective study. Gastrointest Endosc 1999;49:39–42.
9. Campbell BA, Wells GA, Palmer WN, Martin DL. Reuse of disposable medical devices in Canadian hospitals. Am J Infect Control 1987;15:196–200.
10. Ryden L, Fox KM. Reuse of devices in cardiology. Eur Heart J 1999;20:709–10.
11. Gärtner D, Münz K, Hückelheim E, Hesse U. Ultrasonic scissors. New vs resterilized instruments. Chirurg 2008;79:175–9.