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Original Article

Effect of comprehensive high-quality nursing care on postoperative complications, degree of pain, and nursing satisfaction in gallstone patients during perioperative period

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Abstract: Objective: To investigate the influence of comprehensive high-quality nursing care on postoperative complications, degree of pain, and nursing satisfaction in gallstone patients during the perioperative period. Methods: A total of 77 gallstone patients admitted to our hospital were selected as the study subjects, and divided into a control group (n=38) and an experimental group (n=39) in accordance with the random number table method. During the perioperative period, the control group received conventional nursing, while the experimental group received comprehensive high-quality nursing and conventional nursing. The visual analogue scale (VAS) was adopted to score degree of pain in both groups at 6 h, 24 h, and 48 h after surgery. Nursing satisfaction questionnaires were used to evaluate the satisfaction of the two groups of patients. The changes of postoperative complications, pain degrees, and nursing satisfaction were observed in the two groups after nursing interventions during the perioperative period. Results: After comprehensive high-quality nursing intervention, the time to first flatus, time to first defecation, time to first off-bed activity and hospital stay in the experimental group were significantly shorter than those in the control group after surgery ($P < 0.05$). The number of postoperative complications in the experimental group was remarkably lower than that in the control group ($P < 0.05$). After intervention, degree of pain scores in the experimental group were lower than those of the control group ($P < 0.05$). After intervention, the scores of nursing satisfaction in the experimental group were higher than those of the control group ($P < 0.05$). Conclusion: Comprehensive high-quality nursing can improve the incidence of postoperative complications, degree of pain, nursing satisfaction, and the quality of life of gallstone patients during the perioperative period.

Keywords: Gallstones, comprehensive high-quality nursing, complications, pain degree, nursing satisfaction

Introduction

Gallstones (cholelithiasis) include intrahepatic and extrahepatic bile duct stones and gallstones, which are one of the most common biliary diseases in China. Extrahepatic bile duct stones can be divided into primary bile duct stones (PBDS) and secondary bile duct stones (SBDS). PBDS are originally present in the common bile duct or intrahepatic bile duct, whereas SBDS occur as a result of gallbladder or intrahepatic bile duct stones falling into the common bile duct [1, 2]. Since the single occurrence of extrahepatic bile duct stones is rare clinically, most of the patients with extrahepatic bile duct stones have accompanying gallstones or intrahepatic bile duct stones [3]. Gallstone patients often have abdominal pain, jaundice, fever, intestinal obstruction, and bile reflux. For the clinical treatment of large and drug-resistant stones, the lesions should be quickly eradicated by removal of the gallbladder. For the clinical treatment of small stones, minimally invasive surgeries (*e.g.*, laparoscopic exploration and lithotripsy), are primarily implemented. The advantage of such surgeries is

that only 2-3 small openings are cut in the abdomen of patients with small wound surface. However, due to the particularity of biliary system structures, the postoperative deep pain and complications, slow recovery of gastrointestinal function inevitably occurs, which imposes a greater burden to patients' body and mind [4-6].

In order to improve the adverse effects of surgery on patients, researchers should pay attention to the improvement of nursing quality for patients, such as preoperative psychological counseling and postoperative physical function recovery for patients during the perioperative period [7]. In 2006, the World Health Organization defined quality nursing as a patient-oriented, fair, convenient, effective, highly efficient, safe and acceptable model of nursing [8]. In 2010, the National Health and Family Planning Commission (NHFPC) of the People's Republic of China advocated high-quality nursing services throughout the country, so as to strive to provide highly professional and efficient nursing services for patients and improve their quality of life through promoting a comprehensive high-quality nursing mode and improving the shortcomings of the conventional nursing mode.

The objective of this study was to analyze the influences of comprehensive high-quality nursing on postoperative complications, degree of pain, and nursing satisfaction of gallstone patients during the perioperative period, so as to provide a theoretical basis for improving these metrics and the quality of life of gallstone patients during the perioperative period.

Materials and methods

General data

A total of 77 patients diagnosed as gallstones by B-mode ultrasound, CT, MRI imaging or ultrasonography in the Hepatobiliary Surgery Department of our hospital from July 2019 to July 2020 were selected as the study subjects. All patients received LC + LCBDE + T minimally invasive surgery [9]. Among all patients, there were 35 males and 42 females, with a mean age of (42.04 ± 6.18) years.

Exclusion criteria: patients with cerebral hemorrhage, cerebroma and other cerebral diseases; patients with severe pathologic changes in other functional organs; and patients with immunodeficiencies were excluded.

In accordance with the random number table, a total of 77 subjects were divided into a control group (n=38) and an experimental group (n=39). The control group included 16 males and 22 females, with a mean age of (42.24 ± 6.29) years, while the experimental group included 19 males and 20 females, with a mean age of (41.83 ± 6.13) years. There was no significant difference in the general data (*e.g.*, gender, age and weight) between the two groups ($P > 0.05$), and the general data were comparable.

The personal files of 77 patients enrolled were established to register their information (e.g., name, gender, age, contact number, address), and all the patients signed the informed consent forms and voluntarily participated in this study. This study has been reviewed and approved by the Hospital Ethics Committee of the Second Affiliated Hospital of Hainan Medical University.

Intervention methods

The control group received conventional nursing, including preoperative conventional examination, the informed precautions for surgery, active cooperation with the surgeon during surgery, postoperative medication, and dietary guidance.

On the basis of conventional nursing in the control group, the experimental group additionally received comprehensive high-quality nursing. The specific measures were as follows.

(1) Preoperative nursing: Nursing staff assisted patients in completing conventional preoperative examination. The active communication with the patients and their relatives, an introduction of disease-related knowledge, the psychological counseling for preoperative anxiety and nervousness, and a brief introduction of surgical procedures and advantages and successful cases in the hospital were conducted to enhance patient confidence. The encouraging communication was conducted.

Patients who smoke were instructed not to smoke 3 d before surgery to prevent pulmonary infections. On day 1 before surgery, the pa-

tients were instructed to have a liquid diet, no food 12 h before surgery and no water 6 h before surgery. If necessary, appropriate medications should be used to improve the patient's physical conditions.

(2) Intraoperative nursing: In the operating room, the patients' emotions were soothed and verbal encouragement was given, so as to boost their confidence. The patients were instructed to adjust their body positions, cooperate with anesthesiologists for preoperative anesthesia, and take a supine position.

During the surgery, the patients were instructed to actively cooperate with the surgeon to complete the surgery. Throughout the surgical processes, the vital signs monitoring of patients was strengthened. In case of any abnormalities, the physician was notified immediately to implement the rescue measures. After surgery, the patients were sent back to the ward.

(3) Postoperative nursing: After awakening from anesthesia, the patients were placed in a semi-supine position to avoid pain caused by strain on the wound. The patient's vital signs and drainage conditions were closely observed and recorded. In case of any abnormalities, timely measures were implemented and the attending physician was notified.

The families were instructed to properly prepare for the patients' diet. The patients were denied access to food within 6 h after surgery, and instructed to follow a liquid diet in the late period. The patients were instructed to have more meals a day but less food at each, and foods, such as milk and soybean milk, were strictly prohibited. The patients with difficulty in eating could get the supplemented nutrient solution through channels to prevent malnutrition.

The families were instructed to chat with the patients or let patients listen to music, watch TV, *etc*., so as to reduce their postoperative pain through distracting their attention. Patients with an excessive degree of pain were treated with appropriate analgesic drugs.

The postoperative wounds were disinfected regularly every day, and the sterile gauze was replaced to avoid infections. The patients' families were instructed to help the patients turn over every day to prevent pressure sores.

According to the physical recovery conditions, the patients were instructed to conduct exercise properly. Before discharge, the daily life precautions were informed, food and drug guidance was provided, and the patients were instructed to conduct reexamination on schedule.

Observational indices and assessment criteria

Postoperative related indices: The differences of the time to first flatus, time to first defecation, time to first feeding, time to first off-bed activity can reflect the effectiveness of the surgery and nursing. According to the time to first flatus, time to first defecation, time to first off-bed activity and hospital stay recorded by the families of patients, the surgical efficacies of the different nursing interventions in the two groups were assessed. A shorter time indicates a better surgical effect and a better perioperative nursing care [10, 11].

Postoperative complications

After gallstone surgery, the patients were susceptible to fever, infection, biliary fistula, bile duct injury, tube defluxion, and reflux gastritis [12, 13]. The postoperative complications reduced the quality of prognosis and even caused permanent damages to the patients' bodies. The number of cases with postoperative complications after different nursing interventions was assessed in the two groups. A lower incidence of complications indicates a better surgical effect and a better perioperative nursing care.

Pain degrees

Visual analogue scale (VAS) was adopted to assess the pain degrees in the two groups. The scale of 10 cm was used for testing, and there was a movable cursor on the scale. 0 indicates no pain, and 10 indicates the greatest degree of pain. Based on the degree of pain, the patients moved the cursor to the corresponding positions [14, 15]. A higher VSA score indicates a higher degree of pain.

Nursing satisfaction

The nursing satisfaction questionnaire prepared by our hospital comprised four items, namely, professional knowledge level, nursing

Table 1. Comparison of general clinical indices between the two groups ($\bar{x}$ ± s)/[n (%)]

General clinical data		Control group (n=38)	Experimental group (n=39)	t/X^2	*P*
Gender	M	16	19	-0.200	0.874
	F	22	20		
Mean age (years)		42.24 ± 6.29	41.83 ± 6.13	0.319	0.752
Mean weight (kg)		55.48 ± 4.02	55.14 ± 5.60	0.316	0.754

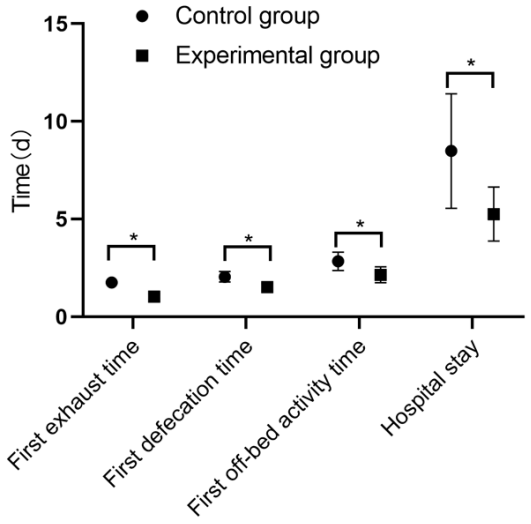

Figure 1. Analysis of changes of postoperative related indices after different nursing interventions. The comparative analysis showed that the time to first exhaust (flatus), time to first defecation, time to first off-bed activity and hospital stay in the experimental group were lower than those in the control group (*P* < 0.05). * indicates a statistically significant difference in the comparison between groups regarding the same indices.

attitude, timeliness of ward round and skill operations. A scoring system of 0-4 points was implemented. A score of 1 point indicates dissatisfaction and 5 points indicates much satisfaction. There were 25 points for each item, totaling 100 points. A higher score indicates a higher satisfaction with nursing [16, 17].

Quality of life

The quality of life in the two groups was assessed by the World Health Organization Quality of Life-BREF (WHOQOL-BREF). WHOQOL-BREF has the four domains, namely, physical health, psychological health, social relationships, and environment. The domain scores are scaled in a positive direction. A higher score denotes a higher quality of life.

Statistical method

SPSS 17.0 was adopted for statistical analysis. The measurement data were expressed using mean ± standard deviation ($\bar{x}$ ± s), and the differences between groups were compared by T test. $P < 0.05$ indicated a significant difference.

Results

Comparison of general clinical indices between the two groups

There was no statistical significance in general clinical indices (*e.g.*, gender, age and weight) between the control group and the experimental group ($P > 0.05$), which were comparable (**Table 1**).

Analysis of changes of postoperative-related indices after different nursing interventions

According to the time to first flatus, time to first defecation, time to first off-bed activity and hospital stay recorded by the families of patients, the surgical efficacies of the different nursing interventions were assessed in the two groups. After intervention, the time to first flatus, time to first defecation, time to first off-bed activity and hospital stay in the experimental group were remarkably shorter than that in the control group ($P < 0.05$) (**Figure 1**).

Analysis of postoperative complications after different nursing interventions

The comparison of the number of postoperative complications (*e.g.*, fever, infection, biliary fistula, tube defluxion and reflux gastritis) showed that the incidence of postoperative complications in the experimental group was markedly lower than that in the control group after intervention, and there were 3 cases with postoperative complications in the experimental group and 9 cases with postoperative complications in the control group. There were sig-

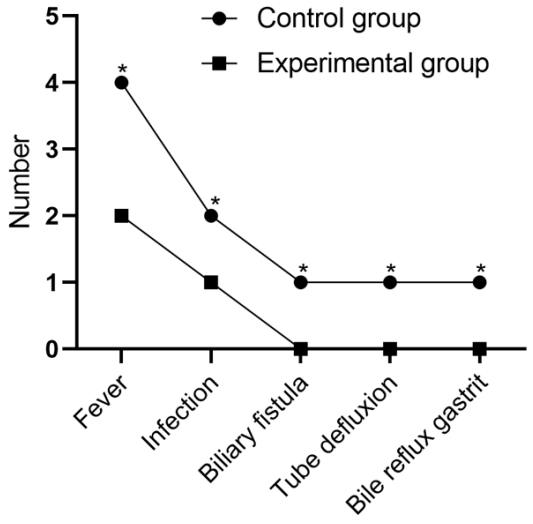

Figure 2. Analysis of postoperative complications after different nursing interventions. The comparative analysis suggested that the number of cases with fever, infections, biliary fistula, tube defluxion, and reflux gastritis in the experimental group was significantly lower than that of the control group ($P < 0.05$). * indicates a statistically significant difference in the comparison between groups regarding the same indices.

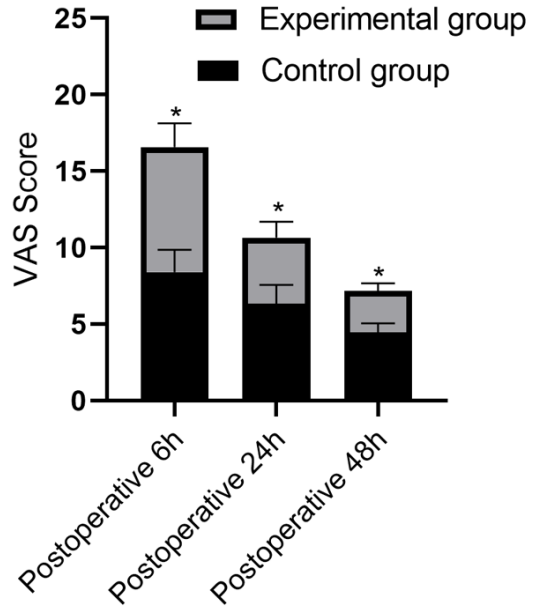

Figure 3. Analysis of degree of pain using VAS after different nursing interventions. The pain degrees in the two groups were scored by VAS at different time points after intervention. The comparative analysis revealed that the pain degree scores in the experimental group were lower than those in the control group at 6 h, 24 h and 48 h after surgery ($P < 0.05$). * indicates a statistically significant difference in the comparison between groups regarding the same indices.

nificant differences in the number of cases with postoperative complications between the two groups ($P < 0.05$) (**Figure 2**).

Analysis of pain degrees after different nursing interventions

After intervention, the scores of VAS in the experimental group were (8.16 ± 1.56) points, (4.31 ± 1.03) points and (2.72 ± 0.51) points respectively at 6 h, 24 h and 48 h after surgery, while those in the control group were (8.41 ± 1.45) points, (6.35 ± 1.23) points, and (4.45 ± 0.60) points, respectively. After intervention, the VAS scores exhibited that the pain degree in the experimental group was significantly lower than that of the control group at different time points after surgery ($P < 0.05$) (**Figure 3**).

Analysis of nursing satisfaction after different nursing interventions

After intervention, the scores for nursing staff's professional knowledge level, nursing attitude, timeliness of ward round and skill operations in the experimental group were higher than those in the control group, and differences were significant between the two groups ($P < 0.05$) (**Figure 4**).

Analysis of changes of quality of life after different nursing interventions

Before intervention, there was no significant difference in WHOQOL-BREF scores between the two groups ($P > 0.05$). After intervention, the scores for physical health, psychological health, social relationships, and environment increased remarkably in the two groups compared with those before intervention. Meanwhile, the scores for physical health, psychological health, social relationships, and environment in the experimental group were higher than those in the control group at the same time point ($P < 0.05$) (**Table 2**; **Figure 5**).

Discussion

With the improvement of people's standard of living, tremendous changes have taken place in the dietary structure. The high fat, high cholesterol and high sugar diet will lead to endocrine-metabolic abnormalities and an increased incidence of gallstones. Recently, gallstones have become more common in young adults. The symptoms of gallstone patients mainly depend on the size and sites of stones,

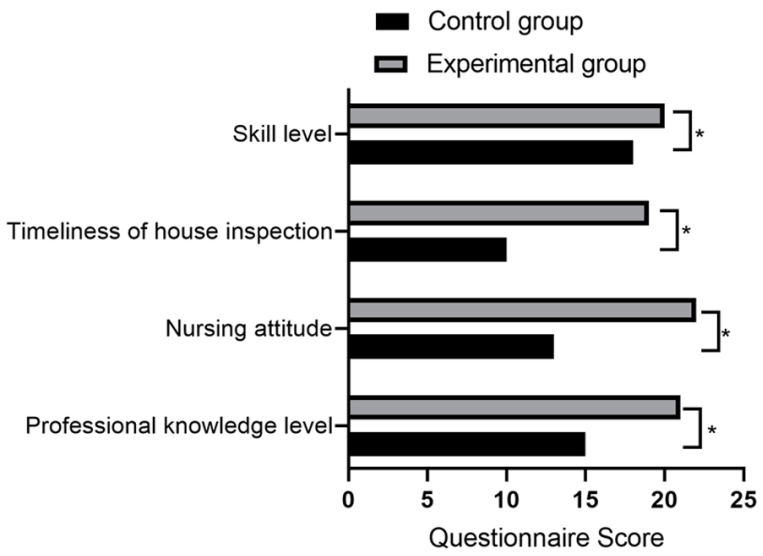

Figure 4. Analysis of nursing satisfaction after different nursing interventions. The comparative analysis exhibited that after intervention, the scores for nursing staff's professional knowledge level, nursing attitude, and timeliness of ward round and skill operations in the experimental group were higher than those in the control group ($P < 0.05$). * indicates a statistically significant difference in the comparison between groups regarding the same indices.

obstruction and inflammation. Some patients have no symptoms for a lifetime, while some patients have clinical manifestations, such as fever, vomiting, jaundice and abdominal pain. The asymptomatic patients can be treated with traditional Chinese medicine (TCM) for conditioning, so as to inhibit the progression of stones and thus eliminate stones in the body. Symptomatic patients can be treated with surgeries to alleviate the pain of patients and prevent canceration [18, 19].

With the advance in medical technologies, minimally invasive surgery has been widely used. Minimally invasive surgery, which has the advantages of high safety, small wound surface and quick wound recovery, can be implemented in hepatobiliary surgery. Currently, laparoscopy has been widely used in the treatment of gallstones [20, 21]. However, the patients' lack of surgical knowledge and fear of surgery can easily lead to their emotional fluctuations before surgery, which increases the difficulty of surgery. Low pain tolerance, anxiety, and nervousness increase the surgical risk and the incidence of complications, which are not conducive to postoperative recovery. Therefore, high quality nursing for gallstone patients during the perioperative period can improve their emotions, treatment initiatives, and prognosis.

The comprehensive high-quality nursing mode with a patient-oriented concept aims to provide comprehensive, scientific, professional, entire, humanized and personalized nursing services for patients. The nursing concept pays more attention to the close relationship between nursing links to ensure the high efficiency of perioperative nursing for gallstone patients [22, 23]. In addition, the nurses can gain practical experience and improve their understanding of the nursing theories, practical nursing skills, and nursing quality through nursing practices, thus striving to provide better nursing services for more gallstone patients [24, 25].

In this study, comprehensive high-quality nursing methods were implemented for gallstone patients during the perioperative period, so as to provide comprehensive nursing services for the patients before, during, and after surgery. Based on the emotional changes of gallstone patients, the timely psychological counseling was provided to relieve their psychological pressure. The patients and their families were informed of correct self-care methods, other care methods, and dietary precautions, so as to reduce the incidence of postoperative complications and shorten the hospital stay. Results suggested that comprehensive and high-quality nursing intervention improved the incidence of postoperative complications, pain degree, nursing satisfaction and the quality of life of gallstone patients.

In summary, comprehensive high-quality nursing intervention can improve the incidence of postoperative complications, degree of pain, and nursing satisfaction of gallstone patients. Therefore, it is worthy of clinical promotion and implementation. The innovation of this study is to implement the comprehensive high-quality nursing mode instead of conventional nursing for the treatment of gallstone patients during the perioperative period, and pay attention to the changes of preoperative, intraoperative and postoperative physical and psychological

Table 2. Comparison of quality of life between the two groups ($\bar{x} \pm s$)/[n (%)]

Group		Physical health	Psychological health	Social relationships	Environment
Control group	Before intervention	31.17 ± 5.41	45.36 ± 5.06	28.64 ± 2.79	58.71 ± 6.14
	After intervention	38.76 ± 2.83[&]	52.84 ± 4.76[&]	30.66 ± 3.14[&]	63.21 ± 7.83[&]
Experimental group	Before intervention	30.35 ± 3.18	44.38 ± 5.33	29.15 ± 2.60	57.69 ± 5.88
	After intervention	50.13 ± 4.32[*,&]	67.10 ± 7.31[*,&]	48.35 ± 5.77[*,&]	78.17 ± 8.10[*,&]

Note: [&]indicates before and after intervention ($P < 0.05$), [*]indicates between groups after intervention ($P < 0.05$).

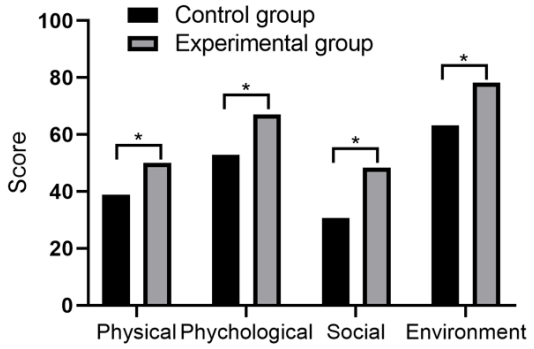

Figure 5. Analysis of changes in quality of life after different nursing interventions. The comparative analysis demonstrated that the scores for physical health, psychological health, social relationships, and environment in the experimental group were higher than those in the control group after intervention ($P < 0.05$). * indicates a significant difference between groups regarding the same indices.

states of gallstone patients, so as to avoid emotional fluctuations and complications caused by nursing omissions, thereby providing an improved nursing experience, and improving their quality of life, complications, quality of prognosis, and nursing satisfaction.

In the existing literature, there are few comprehensive and high-quality nursing approaches for patients with gallstones, and most of the studies focus on postoperative indicators and complications. In this study, long-term follow-up was conducted to analyze the quality of life and nursing satisfaction of the patients, so as to provide a theoretical basis for the application of comprehensive and high-quality nursing path in the perioperative period of patients with gallstones.

There are also some shortcomings in this study. (1) Insufficient and regional samples lead to the lack of universality in the study conclusion. (2) The short follow-up duration and a lack of an analysis of postoperative recurrence and readmission of the patients. In view of the aforementioned shortcomings, the future studies with multi-regional interventions, a large sample size, and a longer follow-up duration should be performed, so as to provide a more detailed theoretical basis for the nursing of gallstone patients.

Disclosure of conflict of interest

None.

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References

[1] Lau LF, Knowles B, Fox A and Banting S. Management of gallstone pancreatitis in the vagrant liver. ANZ J Surg 2018; 88: E741-E742.

[2] Faré PB, Allio I, Monotti R and Foieni F. Fitzhugh-curtis syndrome: a diagnosis to consider in a woman with right upper quadrant abdominal pain without gallstones. Eur J Case Rep Intern Med 2018; 5: 000743.

[3] Mootz A, Familua O, Ojo E and Guerrero R. Large gallstone causing gastric outlet obstruction in a patient with Roux-En-Y gastric bypass. Am Surg 2018; 84: e443-e444.

[4] Tess A, Freedman SD, Kent T and Libman H. How would you treat this patient with gallstone pancreatitis? Grand rounds discussion from beth israel deaconess medical center. Ann Intern Med 2019; 170: 175-181.

[5] Lee CH, Yin WY and Chen JH. Gallstone ileus with jejunum perforation managed with laparoscopic-assisted surgery: rare case report and minimal invasive management. Int Surg 2015; 100: 878-881.

[6] Chang WB, Han HS, Yoon YS, Cho JY and Choi Y. Single incision laparoscopic cholecystectomy for patients with Mirizzi syndrome. Ann Surg Treat Res 2018; 94: 106-111.

[7] Allen-Duck A, Robinson JC and Stewart MW. Healthcare quality: a concept analysis. Nurs Forum 2017; 52: 377-386.
[8] Corkin D and Kenny J. Quality patient care: challenges and opportunities. Nurs Manag (Harrow) 2017; 24: 32-36.
[9] Kaplan U, Shpoliansky G, Abu Hatoum O, Kimmel B and Kopelman D. The lost stone - laparoscopic exploration of abscess cavity and retrieval of lost gallstone post cholecystectomy: a case series and review of the literature. Int J Surg Case Rep 2018; 53: 43-45.
[10] Zhang Y, Peng J, Li X and Liao M. Endoscopic-laparoscopic cholecystolithotomy in treatment of cholecystolithiasis compared with traditional laparoscopic cholecystectomy. Surg Laparosc Endosc Percutan Tech 2016; 26: 377-380.
[11] Ye L, Liu J, Tang Y, Yan J, Tao K, Wan C and Wang G. Endoscopic minimal invasive cholecystolithotomy vs laparoscopic cholecystectomy in treatment of cholecystolithiasis in China: a meta-analysis. Int J Surg 2015; 13: 227-238.
[12] Shabanzadeh DM. Incidence of gallstone disease and complications. Curr Opin Gastroenterol 2018; 34: 81-89.
[13] Portincasa P, Di Ciaula A, de Bari O, Garruti G, Palmieri VO and Wang DQ. Management of gallstones and its related complications. Expert Rev Gastroenterol Hepatol 2016; 10: 93-112.
[14] da Costa DW, Schepers NJ, Bouwense SA, Hollemans RA, van Santvoort HC, Bollen TL, Consten EC, van Goor H, Hofker S, Gooszen HG, Boerma D and Besselink MG. Predicting a 'difficult cholecystectomy' after mild gallstone pancreatitis. HPB (Oxford) 2019; 21: 827-833.
[15] Gülen B, Dur A, Serinken M, Karcıoğlu Ö and Sönmez E. Pain treatment in patients with acute pancreatitis: a randomized controlled trial. Turk J Gastroenterol 2016; 27: 192-196.
[16] McNicholas A, McCall A, Werner A, Wounderly R, Marinchak E and Jones P. Improving patient experience through nursing satisfaction. J Trauma Nurs 2017; 24: 371-375.
[17] McCay R, Lyles AA and Larkey L. Nurse leadership style, nurse satisfaction, and patient satisfaction: a systematic review. J Nurs Care Qual 2018; 33: 361-367.
[18] Yu ML. Association between screen-detected gallstone disease and cancer in a cohort study. Gastroenterology 2017; 153: 1453.
[19] Abraham S, Rivero HG, Erlikh IV, Griffith LF and Kondamudi VK. Surgical and nonsurgical management of gallstones. Am Fam Physician 2014; 89: 795-802.
[20] van den Berg M, van Couwelaar GM, de Raaff CAL, Lagarde SM, Joosse P, van Wagensveld BA and Vrouenraets BC. Are routine preoperative liver function tests in patients with uncomplicated symptomatic gallstone disease necessary? Acta Chir Belg 2017; 117: 290-294.
[21] Mueck KM, Wei S, Pedroza C, Bernardi K, Jackson ML, Liang MK, Ko TC, Tyson JE and Kao LS. Gallstone pancreatitis: admission versus normal cholecystectomy-a randomized trial (Gallstone PANC Trial). Ann Surg 2019; 270: 519-527.
[22] Graham L. Care of patients undergoing laparoscopic cholecystectomy. Nurs Stand 2008; 23: 41-48; quiz 50.
[23] Coleman J. Bile duct injuries in laparoscopic cholecystectomy: nursing perspective. AACN Clin Issues 1999; 10: 442-454.
[24] Taki-Eldin A and Badawy AE. Outcome of laparoscopic cholecystectomy in patients with gallstone disease at a secondary level care hospital. Arq Bras Cir Dig 2018; 31: e1347.
[25] Melmer A, Sturm W, Kuhnert B, Engl-Prosch J, Ress C, Tschoner A, Laimer M, Laimer E, Biebl M, Pratschke J, Tilg H and Ebenbichler C. Incidence of gallstone formation and cholecystectomy 10 years after bariatric surgery. Obes Surg 2015; 25: 1171-1176.