SJIF Impact Factor: 6.711

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 9.
Issue: 10
Page N. 272-278
Year: 2025

Original Article www.wjahr.com

CONTRIBUTING FACTORS FOR CHRONIC DYSPEPSIA AMONG PATIENTS UNDERGOING ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMY IN NINEVEH PROVINCE-IRAQ

[1]*Thaaer Hadi Sultan, [2]Luqman Sultan Hassan Ali, [3]Burhan Ahmed Hamid

[1]M.B.Ch.B/ F.A.B.H.S (General Surgery), Mosul General Hospital.
[2]M.B.Ch.B/ F.A.B.H.S (General Surgery), Shingal General Hospital.
[3]M.B.Ch.B/ F.A.B.H.S (General Surgery), Mosul General Hospital.

Article Received date: 12 August 2025 **Article Revised date:** 01 September 2025 **Article Accepted date:** 22 September 2025

***Corresponding Author: Thaaer Hadi Sultan**
M.B.Ch.B/ F.A.B.H.S (General Surgery), Mosul General Hospital.

DOI: https://doi.org/10.5281/zenodo.17225123

ABSTRACT

Background: Humans are frequently affected by gallstone disease. In addition to abdominal discomfort, gastrointestinal symptoms such dyspepsia, nausea, vomiting, and food intolerance can result from gallbladder stimulation caused by gallstones. With the advent of laparoscopic cholecystectomy, expected decline in the occurrence of post-cholecystectomy, however, several studies have revealed that improvements in abdominal symptoms may vary according on the patient's preoperative circumstances. **Objectives:** To assess the contributing factors for chronic dyspepsia among patients undergoing elective laparoscopic cholecystectomy in Nineveh province/Iraq. **Methods:** This is a prospective observational study conducted at Mosul General Hospital and Shingal (Sinjar) General Hospital From the 1st of November 2021 to the end of December 2023. After evaluation of each patient, the patients were all put on an elective procedure, and in every instance, ultrasonography verified the cholelithiasis diagnosis. Patients were excluded from the study if they did open surgery or if they could not comply with answering the questionnaires after surgery. The questionnaire includes four parts, part one for sociodemographic information of the study participants. Part two for anthropometric information. Part three for patients presenting symptoms and reached diagnosis and part four for persistence postoperative symptoms. **Results:** The study includes 200 patients with symptomatic gallstone. The mean age ± standard deviation of the study participants was 46.46 ± 6.82 years. Of them, 122 (61%) patients were females and 78 (39%) were males, with male to female ratio of 1:1.56. Moreover, 51 (25.5%) patients were active smokers, 23 (11.5%) patients report alcohol intake, 162 (81%) had overweight and obesity. Chronic cholecystitis was diagnosed in 166 (83%) patients. Furthermore, the majority of patients were presented with nausea and food intolerance, right hypochondrial pain, right shoulder radiating pain, their pain precipitate by heavy meal intake, and relieved by fasting. Additionally, 49 patients report persistence of postoperative symptoms and 25 patients report persistence postoperative pain. Statistically significant difference between patient with persistence postoperative dyspepsia and those without persistence dyspepsia regarding their active smoking state, alcohol intake, and presence of overweight and obesity (P value < 0.05). **Conclusion:** Patients with gallstones for which they did laparoscopic cholecystectomy reported high prevalence of persistence dyspepsia. Active smoking, alcohol intake, overweight and obesity increase the possibility of having such symptoms. It's advisable to change these lifestyle factors to avoid this symptom.

KEYWORDS: Gallstone, Indigestion, Iraq, Long term, Nineveh, Postoperative.

1. INTRODUCTION

Humans are frequently affected by gallstone disease.[1] In addition to abdominal discomfort, gastrointestinal (GI) symptoms such dyspepsia, nausea, vomiting, and food intolerance can result from gallbladder stimulation caused by gallstones.[2] For the treatment of symptomatic gallstones, laparoscopic cholecystectomy (LC) has emerged as the gold standard because of its reduced morbidity, shorter hospital stays, and quicker return to work.[3] Almost all gallstone patients experience no

further biliary discomfort following cholecystectomy. Anyhow, patients who have an elective cholecystectomy often have low and variable rates of relief of nonspecific GI problems.[4]

Dyspepsia is a group of symptoms related to the upper gastrointestinal system, including postprandial heaviness, early satiety, and epigastric pain or discomfort.[5] Following a cholecystectomy, up to 40% of patients experience persistent symptoms.[6] Even though the majority of these symptoms are minor and temporary, up to 10% of people experience severe pain as a chronic condition.[7]

With the advent of LC, expected decline in the occurrence of post-cholecystectomy complaints due to the advantages of minimally invasive procedures that cause less adhesions and scar-related difficulties.[8] However, several studies have revealed that improvements in abdominal symptoms following LC may vary according on the patient's preoperative circumstances.[9-11]

Numerous studies have identified a number of factors predicting adverse outcomes.[11-13] The existence of GI disorders such as irritable bowel syndrome or bloating, rather than the primary gallbladder condition, was also linked to the duration of symptoms following cholecystectomy.[6]

After a cholecystectomy, bile insufficiently reaches the gut, therefore, it might not be enough to break down fatty meals. So, some people may benefit from dietary changes, such as intake of low-fatty dishes. In addition to that, enzyme preparations, antispasmodics, and occasionally cholagogues can be beneficial.[14]

The study aimed to assess the contributing factors for chronic dyspepsia among patients undergoing elective laparoscopic cholecystectomy in Nineveh province/Iraq.

2. PATIENT AND METHOD

This is a prospective observational study conducted at Mosul General Hospital and Shingal (Sinjar) General Hospital From the 1st of November 2021 to the end of December 2023. All patients with dyspeptic symptoms who visited the emergency room and surgical consultation clinic were included in the study. An evaluation was conducted by the investigators and LC was arranged for them. After evaluation of each patient, the patients were all put on an elective procedure, and in every instance, ultrasonography verified the cholelithiasis diagnosis. Patients were excluded from the study if they did open surgery or if they could not comply with answering the questionnaires after surgery.

The questionnaire was utilized to gather information on the patient's age, gender, body mass index and social habits such as smoking and alcohol intake. In addition to the pain characteristics (site, duration, frequency, quality, periodicity, triggering events), dyspeptic symptoms (nausea, vomiting, heartburn, food intolerance, early satiety), and bowel movements (bloating, constipation, diarrhea). Preoperative investigation included complete blood counts, liver function test, S. Amylase, and abdominal ultrasound. Patients having a history of cholestatic jaundice due to gallstones, abnormal liver function tests, or dilated common bile duct underwent ERCP and sphincterotomy prior to L.C.

The conventional approach for LC was utilized, with a nasogastric tube used only on occasion. After general anesthesia, patient positioning, and draping, a Veress needle was used for insufflation. CO_2 was employed as an insufflation gas. A 30° camera was employed through a 10 mm port. The standard approach involved using four ports for sharp and blunt dissection, with or without electrocautery. Following surgery, patients were reassessed for the presence of dyspeptic symptoms in the surgical consultation clinic for three to four months. To determine the cause of the persistence of dyspeptic symptoms, specific investigations (such as MRCP & ERCP, and OGD) were included.

The collected data were coded, entered, and analyzed using the available data base software program statistical package of IBM SPSS-29 (IBM Statistical Packages for Social Sciences- version 29, Chicago, IL, USA). Data were presented in simple measures of percentage, mean, standard deviation, median and interquartile rang. Student’s t-test was used to compare numerical variables between the two groups with application of chi square test for categorical variables. Fisher’s exact was used when applicable. Statistical significance was considered whenever the P value was equal or less than 0.05.

3. RESULTS

The study includes 200 patients with symptomatic gallstone. The mean age ± standard deviation of the study participants was 46.46 ± 6.82 years. Of them, 122 (61%) patients were females and 78 (39%) were males, with male to female ratio of 1:1.56.

Table 1 shows distribution of the study participants according to their sociodemographic information. The majority of patients were belonging to the age category of 30-49 years followed by less than 30 years and then those aged more than 50 years. On the other hand, 96 (48%) were not smokers, 51 (25.5%) were active smokers, 42 (21%) were passive smokers, 11 (5.5%) were x-smokers. Lastly, 23 (11.5%) patients report alcohol intake.

Table 1: Distribution of patients with symptomatic gall stone according to their ages. (number = 200)

Variable	Number	Percent
Age (years):		
- Less than 30	38	19%
- 30-49	127	63.5%
- More than or equal to 50	35	17.5%
Smoking state:		
-Active smoker	51	25.5%
-Passive smoker	42	21%
-X-smoker	11	5.5%
-Non smoker	96	48%
Alcohol intake:		
-Yes	23	11.5%
-No	177	88.5%

Table 2 shows distribution of the study patients according to their body mass index. The majority of the study patients had overweight followed by obesity with different grades and less extent they were normal body mass index.

Table 2: Distribution of patients with symptomatic gall stone according to their body mass index. (number = 200)

Body mass index (Kg/ meter ^{2})	Number	Percent
Normal (18.5-24.9)	38	19%
Overweight (25-29.9)	64	32%
Obesity grade I (30-34.9)	57	28.5%
Obesity grade II (35-39.9)	41	20.5%
Obesity grade III (more than 40)	20	10%

Table 3 shows distribution of the study participants according to their diagnosis. The majority of patients had chronic cholecystitis, followed by acute cholecystitis and lastly gall stone pancreatitis.

Table 3: Distribution of patients with symptomatic gall stone according to their diagnosis. (number = 200)

Variable	Number	Percent
Diagnosis:		
-Acute cholecystitis	29	14.5%
-Chronic cholecystitis	166	83%
-Gall stone pancreatitis	5	2.5%

Table 4 shows distribution of the study participants according to their basic presentation. The majority of patients were presented with nausea and food intolerance. Moreover, the majority of patients reported right hypochondrial pain, right shoulder radiating pain, their pain precipitate by heavy meal intake, and relieved by fasting.

Table 4: Distribution of patients with symptomatic gall stone according to their basic presentation. (number = 200).

Variable	Number	Percent
Presenting symptoms*:		
Nausea	184	92%
Food intolerance	168	84%
Early satiety	89	44.5%
Vomiting	121	60.5%
Bloating	26	13%
Heart burn	54	27%
Diarrhea	9	4.5%
Constipation	8	4%
Jaundice	4	2%
Site of pain:		
-Right hypochondrial pain	175	77.5%
-Epigastric pain	17	8.5%

-Lower abdomen	7	3.5%
Radiation:		
-Right shoulder	161	80.5%
-Back	22	11%
-Mixed	13	6.5%
-No radiation	4	2%
Precipitating factors:		
-Heavy meal	78	39%
-Stressful conditions	47	23.5%
-Drugs	33	16.5%
-Hunger	42	21%
Relieving factors **:		
-Fasting	111	55.5%
-Analgesic drug	61	30.5%
-Anti-acid drug	58	29%

*Some patients had more than one symptom.
**Some patients had more than one relieving factor.

Table 5 shows distribution of the study participants according to their persistence postoperative symptom. Among 49 patients report persistence of postoperative symptoms. Dyspepsia was present in 43 (87.8%) patients, while colonic symptoms was present in 5 (10.2%) patients and only one (2%) patient had persistence jaundice.

Table 5: Distribution of the patients with symptomatic gall stone according to their Persistence postoperative symptom. (number = 49).

Variable	Number	Percent
Dyspepsia	43	87.8%
Colonic symptoms	5	10.2%
Jaundice	1	2.0%

Figure 1 showed causes of persistence postoperative dyspepsia. Among 43 patients report persistence postoperative dyspepsia. 23 (54%) patients had gastroesophageal reflux disease, 10 (23%) had irritable bowel syndrome, 6 (14%) had duodenal ulcer and 4 (9%) patient had common bile duct stone.

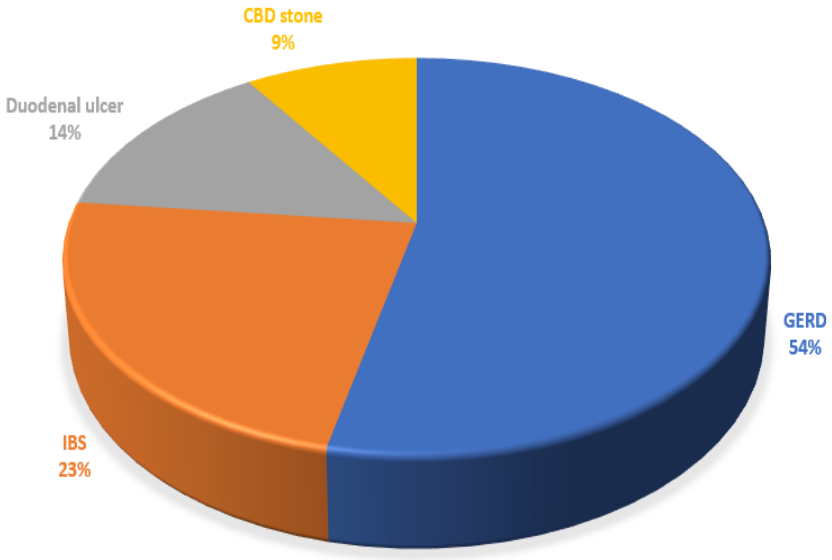

Figure 1: Causes of persistence postoperative dyspepsia.

Figure 2 shows site of persistence postoperative pain. Among 25 patients report persistence postoperative pain, 13 (52%) patients had epigastric pain, 10 (40%) patients had right hypochondrial pain and 2 (8%) patients had lower abdominal pain.

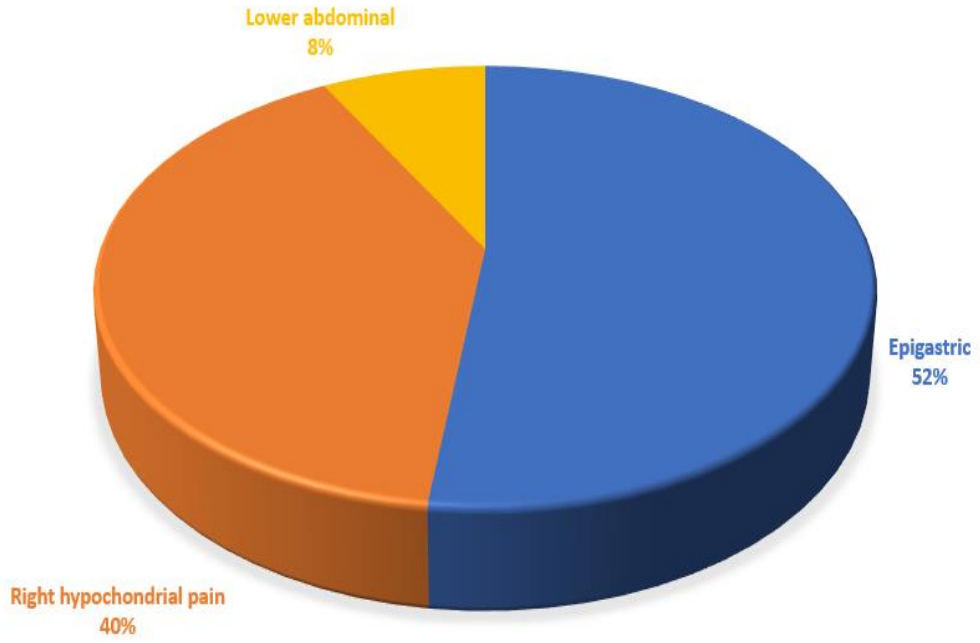

Figure 2: Site of persistence postoperative pain.

Table 6 shows comparison between patients with persistence postoperative dyspepsia and those without persistence postoperative dyspepsia according to their different variable included in the study. Statistically significant difference between them regarding their active smoking state, alcohol intake, and presence of overweight and obesity (P value < 0.05). On the other hand, no statistically significant difference between the two groups regarding their mean age, gender and patients' diagnosis (P value > 0.05).

Table 6: Comparison between patients with persistence postoperative dyspepsia and those without persistence postoperative dyspepsia according to sociodemographic and anthropometric measures. (number = 200)

Variable	Patient with persistence postoperative dyspepsia = 49	Patient with no postoperative dyspepsia = 151	P-value
Age (year), mean ± standard deviation	47.64 ± 6.79	45.92 ± 7.12	0.239
Male/ female	19/30	59/92	0.891
Active smoking	28 (57.1%)	23 (15.23%)	**<0.001**
Alcohol drinker	11 (22.4%)	12 (7.9%)	**<0.001**
Overweight and obesity	45 (91.83%)	117 (77.5%)	**0.009**
Diagnosis: -Acute cholecystitis -Chronic cholecystitis -Gall stone pancreatitis	 10 (20.4%) 37 (75.5%) 2 (4.1%)	 19 (12.6%) 129 (85.4%) 3 (2%)	 0.387

4- DISCUSSION

Dyspepsia is a pain or discomfort in the upper abdomen that affects 25% of the population.[15] Gallstones may cause some dyspeptic symptoms without biliary colic, but 70% of these patients still benefit from surgery.[16]

The study found that the mean age for patients with gallstone was 46.7 years, which agrees with a study the relationship of BMI and age with gallstone disease (46.2) years[17] and with another study focusing on the prevalence of different types of gallstones in relation to age in Sudan (45.9) years[18] However, in a study conducted in central India found the mean age of gallstone patients to be (43.6) years[19] These disparities in mean age can be attributable to a variety of factors, including the sample being studied, geographical

location, and lifestyle choices. It is crucial to remember that gallstone occurrence rises with age, peaking after 40 due to decrease in the activity of cholesterol 7α-hydroxylase, the enzyme responsible for bile acid production.[20] Additionally, the study found women had more gallstones than men, this increased risk is attributed to hormones like estrogen elevating cholesterol in bile, and progesterone, which slows gallbladder emptying, contributing to bile that is more cholesterol-saturated and prone to stone formation. Moreover, factors such as pregnancy and the use of oral contraceptives also raise a woman's risk of developing gallstones. Comparable findings found by other studies.[21-22] Additionally; the study found that active smokers, passively smokers and x-smokers collectively affect by gallstone more than non-smokers. However, the relationship between smoking and gallstones is complex, and the mechanism may involve how smoking affects gallbladder emptying and motility, similar finding shown by Degirmenci et al study finding.[23] Furthermore, the study found that 11.5% of gall stone patients were taken alcohol, while alcohol consumption is generally linked to a reduced risk of gallstones, there is evidence suggesting a potential association between alcohol consumption and gallstone development in specific contexts, like cirrhosis.[24]

The study found that there is considerable portion (81%) of gallstone patients had overweight and obesity, this strong association exists because excess body fat increases cholesterol in bile and can slow gallbladder contractions, leading to bile stasis and an increased risk of gallstone formation. Furthermore, rapid weight loss is known risk factors for developing gallstones.[25] Consistent finding obtained by Raheem's study.[21]

On the other hand, the majority of the study patients had chronic cholecystitis and to less extent acute cholecystitis and gall stone pancreatitis. As Chronic cholecystitis results from repeated episodes of acute inflammation, often caused by gallstones, leading to gallbladder wall thickening and shrinking. In contrast, gallstone pancreatitis occurs when gallstones block the bile duct, leading to inflammation of the pancreas. Shabbir et al had parallel findings.[26]

Regarding the patient presentation, the study found that most of gallstone patients reported nausea and food intolerance and experienced right hypochondrial discomfort and right shoulder radiating pain, which was exacerbated by high meal intake and alleviated by fasting, which is matches classic symptoms of symptomatic gallstone disease. These symptoms are resulted from the gallbladder contracting against gallstones, causing blockages in the bile ducts. Al-Budaerany et al showed similar findings.[27]

The main finding of this study was approximately quarter (24.5%) of the patients undergoing laparoscopic cholecystectomy had persistent postoperative symptoms. Additionally, dyspepsia was the most common symptom (87.8%). Moreover, gastroesophageal reflux disease was the most common cause of dyspepsia followed by irritable bowel syndrome and duodenal ulcer. On the other hand, persistence postoperative pain mainly at epigastric and right hypochondrial region was reported in (12.5%) of the study participants. These finding are less than what was reported by other studies.[28-29] And higher than what was found by Al-Budaerany et al.[27] Anyhow, small sample size and different patient characteristics lead to this disparity. Additionally, the study shows a significant association between lifestyle factors such as smoking, alcoholism, being overweight, and obesity with the persistence of dyspepsia after laparoscopic cholecystectomy. Which runs with other study findings.[21, 29]

5. CONCLUSION

Patients with gallstones for which they did laparoscopic cholecystectomy reported high prevalence of persistence dyspepsia. Active smoking, alcohol intake, overweight and obesity increase the possibility of having such symptoms. It's advisable to change these lifestyle factors to avoid this symptom.

ACKNOWLEDGEMENT

We would like to express our deepest appreciation for our Families. In this respect, we also would like to thank the healthcare workers in Mosul general hospital and Shingal General Hospital in Nineveh/ Iraq.

REFERENCES

1. Wang X, Yu W, Jiang G, Li H, Li S, Xie L, Bai X, Cui P, Chen Q, Lou Y, Zou L. Global epidemiology of gallstones in the 21st century: a systematic review and meta-analysis. Clinical Gastroenterology and Hepatology, 2024 Aug 1; 22(8): 1586-95.
2. Lammert F, Wittenburg H. Gallstones: prevention, diagnosis and treatment. InSeminars in Liver Disease 2024 Aug 2. Thieme Medical Publishers, Inc.
3. Mishra S, Dwivedi P. Surgical Management of Cholelithiasis, A Literature Review. Journal of Universal College of Medical Sciences, 2024 Dec 31; 12(03): 39-43.
4. Lindseth GN, Denny DL. Patients' experiences with cholecystitis and a cholecystectomy. Gastroenterology Nursing, 2014 Nov 1; 37(6): 407-14.
5. Saito A, Nowak T, Wo J. Understanding symptoms of gastric dysmotility: Nausea, vomiting, abdominal pain, postprandial fullness, and early satiety. InHandbook of Gastrointestinal Motility and Disorders of Gut-Brain Interactions, 2023 Jan 1 (pp. 87-97). Academic Press.
6. Shabanzadeh DM. The symptomatic outcomes of cholecystectomy for gallstones. Journal of Clinical Medicine, 2023 Feb 28; 12(5): 1897.
7. Xia M. Pain in Abdominal Viscera. InVisceral Pain: From Bench to Bedside 2024 May 26 (pp. 199-253). Singapore: Springer Nature Singapore.

8. Alotaibi AM. Post-cholecystectomy syndrome: A cohort study from a single private tertiary center. Journal of Taibah University Medical Sciences, 2023 Apr 1; 18(2): 383-9.
9. Di Buono G, Romano G, Galia M, Amato G, Maienza E, Vernuccio F, Bonventre G, Gulotta L, Buscemi S, Agrusa A. Difficult laparoscopic cholecystectomy and preoperative predictive factors. Scientific reports, 2021 Jan 28; 11(1): 2559.
10. Tian F, Sun X, Yu Y, Zhang N, Hong T, Liang L, Yao B, Song L, Pei C, Wang Y, Lu W. Comparison of low-pressure and standard-pressure pneumoperitoneum laparoscopic cholecystectomy in patients with cardiopulmonary comorbidities: a double blinded randomized clinical trial. BMC surgery, 2024 Nov 6; 24(1): 348.
11. Qin J, Gou LY, Zhang W, Pu X, Zhang P. Enhanced recovery after surgery versus conventional care in cholecystectomy: A systematic review and Meta-Analysis. Journal of Laparoendoscopic & Advanced Surgical Techniques, 2024 Aug 1; 34(8): 710-20.
12. Aslanova AD, Kalibatova RM, Evgenievna O. Improvement of surgical intervention in laparoscopic cholecystectomy: Description and cohort study.
13. Bayoumi HM, Abdelaziz DH, El Said NO, Boraii S, Bendas ER. Postoperative pain management following laparoscopic cholecystectomy-non-opioid approaches: a review. Future Journal of Pharmaceutical Sciences, 2024 Sep 16; 10(1): 125.
14. Dahmiwal T, Zade A, Tote D, Reddy S, Sudabattula K, Zade AA, Reddy ES. Dietary considerations in cholecystectomy: investigating the impact of various dietary factors on symptoms and outcomes. Cureus, 2024 May 27; 16(5).
15. Kadar AM. A Clinical Study Of Upper Gastrointestinal Endoscopy Findings In Patients Presenting With Dyspepsia. International Journal, 2022 Jan; 5(1): 520.
16. Mentes BB, Akin M, Irkörücü O, Tatliciolu E, Ferahköe Z, Yildinm A, et al. Gastrointestinal quality of life in patients with symptomatic or asymptomatic cholelithiasis before and after laparoscopic cholecystectomy. Surgical endoscopy. 2001 Nov 1; 15(11): 1267-72.
17. Shahzad F, Waqar SH, us Siraj M, Mirza TI, Shah SA, Ahsan MF. Relationship of BMI and age with gallstone disease. Annals of PIMS-Shaheed Zulfiqar Ali Bhutto Medical University, 2020 Nov 17; 16(2): 69-72.
18. Idris SA, Shalayel MH, Elsiddig KE, Hamza AA, Hafiz MM. Prevalence of different types of gallstone in relation to age in Sudan. Sch. J. App. Med. Sci, 2013; 1(6): 664-7.
19. Bansal A, Akhtar M, Bansal AK. A clinical study: prevalence and management of cholelithiasis. Int Surg J. 2014 Nov 10; 1(3): 134-9.
20. Pak M, Lindseth G. Risk Factors for Cholelithiasis. Gastroenterol Nurs. 2016 Jul-Aug; 39(4): 297-309.
21. Raheem SA, Kakey IS. Study of risk factors and liver function markers in gallstone patients in Iraqi Kurdish Women. Passer Journal of Basic and Applied Sciences, 2023 Aug 2; 5(2): 311-7.
22. de Bari O, Wang TY, Liu M, Paik CN, Portincasa P, Wang DQ. Cholesterol cholelithiasis in pregnant women: pathogenesis, prevention and treatment. Annals of hepatology, 2014 Nov 1; 13(6): 728-45.
23. Degirmenci B, Albayrak R, Haktanir A, Acar M, Yucel A. Acute effect of smoking on gallbladder emptying and refilling in chronic smokers and nonsmokers: a sonographic study. World J Gastroenterol, 2006 Sep 14; 12(34): 5540-3.
24. Cha BH, Jang MJ, Lee SH. Alcohol consumption can reduce the risk of gallstone disease: a systematic review with a dose-response meta-analysis of case-control and cohort studies. Gut and liver, 2019 Jan 15; 13(1): 114.
25. Stokes CS, Lammert F. Excess Body Weight and Gallstone Disease. Visc Med, 2021 Aug; 37(4): 254-260.
26. Shabbir A, Irshad Z, Javed S, Nadeem F, Jaffar N, Hasan SM. Morphological Spectrum of Gall Bladder Diseases at a Tertiary Care Hospital of Karachi. Annals of Jinnah Sindh Medical University, 2020 Jul 11; 6(1): 24-8.
27. Al-Budaerany AR, Manhal MM, Al-Mohammedawi JQ. Prevalence and Determinants of Persistent Dyspeptic Symptoms after Elective Laparoscopic Cholecystectomy. Iraqi Medical Journal, 2019 Jul; 65(2): 129-36.
28. Thunnissen FM, Baars C, Arts R, Latenstein CS, Drenth JP, van Laarhoven CJ, Lantinga MA, de Reuver PR, Buyne O, Donkervoort SC, Heisterkamp J. Persistent and new-onset symptoms after cholecystectomy in patients with uncomplicated symptomatic cholecystolithiasis: A post hoc analysis of 2 prospective clinical trials. Surgery, 2023 Oct 1; 174(4): 781-6.
29. Shrestha R, Chayaput P, Wongkongkam K, Chanruangvanich W. Prevalence and predictors of postcholecystectomy syndrome in Nepalese patients after 1 week of laparoscopic cholecystectomy: a cross-sectional study. Scientific Reports, 2024 Feb 28; 14(1): 4903.