Acupuncture Management of Right Upper Abdominal Pain in Cholecystitis: A Case Study

Tri Ardani[1]*, Ikhwan Abdullah[2], Mayang Wulandari[3], Leny Candra Kurniawan[4]

[1,2,3,4] Diploma III Program in Acupuncture, Faculty of Science and Technology, Dr. Soepraoen Institute of Technology, Science, and Health, Kesdam V/Brawijaya, Malang, East Java 65147, Indonesia
* Corresponding Author:
Email: triardani78@gmail.com

Abstract.

Right-sided abdominal pain caused by gallbladder inflammation (cholecystitis) is a common clinical condition that can significantly affect patients' quality of life. Conventional management generally focuses on pharmacological therapy and surgical intervention, but these approaches may present limitations such as adverse effects and high medical costs. Therefore, complementary therapeutic approaches such as acupuncture have gained increasing attention as potential supportive treatments. This study aimed to describe the implementation and clinical outcomes of acupuncture care in reducing right-sided abdominal pain in a patient with cholecystitis treated at a therapy center in Banjarmasin. The research employed a qualitative case study design involving a 45-year-old female patient diagnosed with cholecystitis. Data were collected using a structured client data sheet based on the Traditional Chinese Medicine (TCM) diagnostic framework, including observation (Wang), listening and smelling (Wen), inquiry (Wen), and palpation (Qie). The participant received six acupuncture therapy sessions over a one-week period. Data analysis was conducted descriptively by comparing clinical findings before and after treatment. The results showed significant improvement in both subjective complaints and objective clinical indicators. The patient initially presented with severe right upper abdominal pain accompanied by nausea, decreased appetite, bitter taste in the mouth, and radiating pain to the scapula. After six therapy sessions, the main complaint of abdominal pain disappeared, accompanying symptoms decreased markedly, and physical examination findings improved. Ultrasonography also indicated the disappearance of previously detected gallstones. These findings suggest that acupuncture therapy may contribute to symptom reduction and functional improvement in patients with cholecystitis.

Keywords: *Acupuncture Therapy; Abdominal Pain; Cholecystitis; Complementary Medicine and Traditional Chinese Medicine.*

I. INTRODUCTION

Right-sided abdominal pain caused by gallbladder inflammation represents a common clinical complaint that significantly affects patients' comfort and daily functioning. This condition is frequently underestimated in the early stages, even though persistent abdominal pain may develop into more serious complications if not properly managed. Gallbladder inflammation, or cholecystitis, is defined as an inflammatory condition of the gallbladder that commonly arises from obstruction of the cystic duct by gallstones or infection. Clinically, the disorder is often characterized by acute pain in the right upper quadrant accompanied by systemic symptoms such as nausea, vomiting, fever, and loss of appetite. Without appropriate management, the inflammatory process may progress and result in more severe pathological conditions [1,2].The burden of gallbladder disease continues to increase and has become a relevant public health concern in many regions. Data from the Indonesian Ministry of Health indicate that the prevalence of gallbladder disease in Indonesia reaches approximately 10% of the population, with incidence rates rising alongside unhealthy dietary patterns [3]. In Banjarmasin, about 15% of patients visiting hospitals report abdominal pain associated with gallbladder disorders, highlighting the magnitude of the problem at the local level [4]. Pathophysiologically, most cases of cholecystitis originate from gallstones obstructing the cystic duct, which leads to bile stasis, increased intraluminal pressure, mucosal irritation, and subsequent inflammation.

Secondary bacterial infection may further aggravate the inflammatory response and increase the risk of complications such as empyema, perforation, or sepsis [5,6].Conventional management of cholecystitis generally focuses on controlling infection and inflammation through antibiotic therapy, analgesics, and supportive care, followed by definitive surgical intervention such as cholecystectomy in selected cases [7]. Although pharmacological treatment can reduce pain and control inflammation, the prolonged use of analgesics may be associated with adverse effects, including gastrointestinal irritation and potential dependence. These limitations have encouraged the exploration of complementary therapeutic approaches

that may help reduce symptoms while minimizing undesirable side effects.Within the framework of Traditional Chinese Medicine (TCM), gallbladder inflammation is understood as a manifestation of internal imbalance involving the Liver and Gallbladder systems. The disorder is commonly associated with patterns such as Liver Qi stagnation and the accumulation of damp-heat in the Liver and Gallbladder channels, which obstruct the smooth flow of Qi and trigger pain in the hypochondriac region [8].

From this perspective, treatment aims not only to relieve pain but also to restore the balance of Qi and eliminate pathogenic factors through therapeutic modalities such as acupuncture, herbal medicine, and dietary regulation. Previous studies have indicated that acupuncture may help regulate Qi circulation, reduce inflammation, and alleviate pain associated with digestive and hepatobiliary disorders [9].Despite growing interest in integrative and complementary medicine, clinical documentation regarding the application of acupuncture care for abdominal pain caused by cholecystitis remains limited, particularly in real-world therapeutic settings. Most available literature focuses on theoretical explanations of TCM mechanisms or general management of gallbladder disorders, while detailed clinical descriptions of acupuncture-based case management are still relatively scarce. This gap highlights the importance of presenting empirical evidence that illustrates how acupuncture care is implemented in clinical practice and how it contributes to symptom relief in patients with gallbladder inflammation.Therefore, this study aims to describe the implementation and potential benefits of acupuncture care in reducing right-sided abdominal pain in a patient with gallbladder inflammation treated at a therapy center in Banjarmasin. By documenting the clinical process and therapeutic outcomes, this case study is expected to provide practical insight into the role of acupuncture as a complementary approach in managing pain associated with cholecystitis and contribute to the growing body of literature on integrative treatment strategies for hepatobiliary disorders.

II. METHODS

This study employed a qualitative case study design to describe the implementation of acupuncture care for a patient experiencing right-sided abdominal pain associated with cholecystitis. The research focused on documenting the entire process of acupuncture care, beginning with patient assessment and diagnosis, followed by treatment planning, therapeutic intervention, and evaluation of clinical outcomes. The primary objective of this design was to obtain a comprehensive description of how acupuncture therapy is applied in clinical practice and how it contributes to the management of abdominal pain. Data collection was conducted using a structured client data sheet that enabled systematic observation and documentation of the acupuncture care process from the initial consultation to the completion of therapy.The research target consisted of a single participant selected from clients receiving treatment at Sumber Sehat Therapy Center in Banjarmasin. The participant was a 45-year-old female who presented with right-sided abdominal pain associated with cholecystitis and agreed to participate in the study as well as to receive acupuncture care according to the established procedures. The selection of the participant was based on purposive considerations, including the presence of relevant clinical complaints, the willingness to participate in the study, and the availability to complete the planned treatment sessions. The study was conducted over a one-week period from January to February 2026, during which the participant received a total of six acupuncture therapy sessions scheduled one times per day.

Data collection began after obtaining approval from the academic supervisor and official permission from the Head of the D-III Acupuncture Study Program at ITSK RS dr. Soepraoen Malang, followed by authorization from the management of Sumber Sehat Therapy Center in Banjarmasin. The participant was informed about the objectives and procedures of the study and provided written informed consent before data collection began. The researcher then conducted an acupuncture examination using a structured client data sheet designed to record clinical information obtained through the traditional diagnostic framework of Traditional Chinese Medicine. The examination consisted of four diagnostic methods: observation (Wang), listening and smelling (Wen), inquiry or interview (Wen), and palpation (Qie). Observational assessment included evaluation of the patient's Shen, facial complexion, body condition, and tongue characteristics. Listening and smelling examinations focused on aspects such as voice quality, breathing patterns, and body odors. The inquiry component gathered detailed information regarding the patient's identity, main

complaints, accompanying symptoms, medical history, lifestyle patterns, and family history. Palpation involved examination of the painful area, specific acupuncture points, and pulse diagnosis. Supporting medical information, including laboratory results, radiological findings, and other relevant medical records, was also reviewed when available.

The data obtained through these diagnostic procedures were then processed through a data reduction stage to identify clinically relevant information with diagnostic value. The selected data were organized and synthesized to establish both biomedical and Traditional Chinese Medicine diagnoses, including the identification of disease conditions and underlying syndrome patterns. This diagnostic formulation served as the basis for developing an individualized acupuncture treatment plan. The treatment plan included determination of therapeutic principles, selection of acupuncture points and their functions, specification of needle manipulation techniques, scheduling of therapy sessions, and provision of lifestyle and health recommendations to the participant.Implementation of the acupuncture therapy followed standard clinical procedures to ensure safety and therapeutic effectiveness. The treatment process included preparation of facilities, equipment, and materials; obtaining the participant's consent prior to each session; positioning the participant appropriately; performing hand hygiene and using personal protective equipment; preparing the needling sites; inserting acupuncture needles with appropriate techniques; maintaining needle retention for the specified duration; and safely removing and disposing of needles after treatment. During the therapy sessions, the practitioner remained with the participant to monitor responses to treatment and to prevent possible adverse events or injuries.

Each session also included documentation of the participant's immediate responses to the intervention.Evaluation was conducted at two levels: process evaluation and outcome evaluation. Process evaluation was performed immediately after needle removal during each therapy session and included reassessment using the four diagnostic methods. This evaluation examined changes in physical signs, including needle insertion sites, facial expression, voice and breathing patterns, subjective complaints, and palpation findings such as tenderness or pulse characteristics. Outcome evaluation consisted of a preliminary conclusion regarding the participant's response to therapy and the appropriateness of continuing treatment according to the planned schedule or considering other clinical actions if necessary. Prognosis was also assessed during the study, with categories including sanam (recovered), bonam (good), malam (poor), and dubia (uncertain), depending on the observed clinical progression.To ensure the credibility of the data, several validation strategies were applied. The researcher acted as the primary instrument in the study, emphasizing careful observation and accurate documentation.

Data validity was strengthened through prolonged engagement in the therapeutic process and triangulation of information sources, including the participant, the acupuncture therapist, and the participant's close family members. Ethical considerations were strictly maintained throughout the research process. The participant's dignity, privacy, and confidentiality were protected, and all personal information was anonymized. Participation was voluntary, and the participant was informed about the study objectives, procedures, and potential benefits before providing written consent.Data analysis was conducted descriptively by interpreting the clinical information obtained from the client data sheets to formulate disease and syndrome diagnoses and to evaluate therapeutic outcomes. The analysis involved organizing, categorizing, and comparing clinical data collected across multiple therapy sessions. Cross-session comparison was applied to examine changes between treatment sessions, such as comparisons between session one and session two, session one and session three, and subsequent sessions. The analysis considered both process data—such as examination results, diagnostic formulation, treatment planning, and therapy implementation—and outcome data, including observed clinical changes, level of symptom improvement, prognosis, and the need for referral. Through this analytical approach, the study aimed to illustrate the therapeutic process and the potential benefits of acupuncture care in reducing right-sided abdominal pain associated with cholecystitis.

III. RESULT AND DISCUSSION

The present case study examined the implementation of acupuncture care for the management of right upper abdominal pain associated with cholecystitis at Sumber Sehat Therapy Center in Banjarmasin. The study focused on documenting clinical findings before and after a series of acupuncture treatments and interpreting the observed changes through the theoretical framework of Traditional Chinese Medicine (TCM) as well as available empirical evidence. The findings illustrate how systematic acupuncture intervention may contribute to the reduction of symptoms, functional recovery, and improvement in clinical indicators related to gallbladder inflammation.

Research Setting and Participant Characteristics

The research was conducted at Sumber Sehat Therapy Center in Banjarmasin, a complementary therapy facility that provides acupuncture-based health services. The clinic is equipped with basic treatment facilities including a treatment bed, chairs, a patient examination table, weighing equipment, height measurement tools, a blood pressure monitor, and an acupuncture anatomical model used for educational and clinical reference. Therapeutic equipment available at the facility includes filiform acupuncture needles of various sizes, electrostimulation devices, moxibustion tools, TDP heat lamps, and other materials necessary to support acupuncture procedures. These facilities enabled the practitioner to conduct systematic clinical assessments and administer acupuncture therapy in accordance with professional standards.The participant in this case study was a female patient, referred to as Mrs. H, aged 45 years, residing in Banjarmasin.

She first visited the therapy center on January 28, 2026 with complaints of right upper abdominal pain. The participant agreed to undergo acupuncture therapy and to participate in the documentation process required for the study. The treatment period lasted several weeks and involved multiple acupuncture sessions designed to monitor symptom progression and therapeutic response.Understanding the clinical background of the participant is essential for interpreting the results of this case study. The participant had a history of hypercholesterolemia and reported frequent consumption of fatty foods such as fried foods and coconut milk–based dishes. These lifestyle patterns are known risk factors for gallbladder disorders and contribute to the formation of gallstones. The presence of gallstones had previously been confirmed through ultrasonography (USG), indicating a biomedical diagnosis consistent with cholecystitis associated with cholelithiasis. These initial conditions provided a clear clinical context for evaluating the effects of acupuncture intervention.

Clinical Findings Before and After Acupuncture Therapy

The comparison between the first therapy session and the sixth therapy session demonstrates substantial changes in both subjective complaints and objective clinical indicators. At the first session, the participant presented with severe right upper abdominal pain described as a sharp, stabbing sensation localized in the hypochondrium region. The pain was reported to worsen after the consumption of fatty foods and occasionally radiated toward the right scapular area. This symptom pattern is typical of gallbladder inflammation and biliary obstruction.In addition to the main complaint, the participant reported several accompanying symptoms, including nausea, decreased appetite, a bitter taste in the mouth, and headaches localized in the parietal region, particularly before midnight. These symptoms significantly affected the participant’s quality of life and sleep patterns, as she reported difficulty sleeping due to persistent pain. Observation-based examination revealed several notable physical signs. The participant’s facial complexion appeared dull yellow with mild redness in the cheek area. The sclera of the eyes appeared slightly yellowish and cloudy. The lips were dark red and dry, and the skin exhibited a yellowish tone with a warm sensation upon touch. Postural observation showed that the participant tended to bend forward while protecting the right side of the abdomen during movement, indicating discomfort and pain avoidance behavior.Tongue examination also revealed important diagnostic information.

The tongue body appeared red on both sides and slightly swollen, with visible teeth marks along the edges. The tongue coating was thick, yellow, and greasy, while the sublingual veins appeared dark and swollen. According to Traditional Chinese Medicine diagnostic principles, these findings strongly indicate the presence of damp-heat accumulation affecting the Liver and Gallbladder meridians.Further examination using listening and smelling techniques revealed that the participant’s voice was generally clear but

occasionally interrupted during speech due to discomfort. The patient also exhibited sighing behavior and frequent belching. From a diagnostic perspective, these symptoms may reflect stagnation of Liver Qi affecting digestive function.Information obtained through the inquiry (interview) examination reinforced these findings. The participant reported radiating pain toward the right shoulder blade, a persistent bitter taste in the mouth, reduced appetite, and foul-smelling bowel movements. Urination appeared dark yellow, and the patient experienced thirst with a preference for cold drinks. These symptoms are consistent with internal heat and dampness accumulation in TCM theory. Palpation findings further confirmed the severity of the condition. The pulse was described as wiry, rapid, and slightly weak, indicating tension in Liver Qi flow accompanied by internal heat. Palpation of the right hypochondrium revealed sharp tenderness and abdominal muscle tension.

The skin temperature in the affected area was also warmer compared to surrounding tissues, indicating localized inflammation.In contrast, the clinical findings at the sixth therapy session showed remarkable improvement in both subjective and objective indicators. The participant reported that the primary complaint of right abdominal pain had completely disappeared. Nausea was no longer present, and the headaches had significantly decreased in frequency and intensity.Observation examination revealed visible improvements in physical appearance and body posture. The participant's facial expression appeared more relaxed and fresh, and the yellowish complexion had diminished. The sclera appeared clearer, and the lips had returned to a healthier pink color. The participant was able to move more freely, and her body posture had become more upright without the protective bending previously observed.Changes were also observed in tongue characteristics. The tongue body appeared pinkish rather than red, and swelling had decreased. Teeth marks were still present but less prominent. The tongue coating had become thinner and lighter yellow, indicating a reduction in damp-heat accumulation.Listening and smelling examination indicated further improvements.

The participant's speech was no longer interrupted, sighing had disappeared, and belching occurred only occasionally. These changes suggest that the stagnation affecting digestive and respiratory function had improved significantly.Interview findings also showed meaningful changes. Radiating pain toward the scapular region was no longer present, and the bitter taste in the mouth occurred only occasionally. Appetite improved considerably, bowel movements became more regular and less foul-smelling, and urine color returned to a lighter yellow. Sleep quality also improved, with the participant reporting deeper and more restful sleep.Palpation findings confirmed the clinical improvements observed in other examinations. The pulse became more moderate, although slightly wiry characteristics remained. Local tenderness in the right hypochondrium decreased significantly, abdominal muscle tension reduced, and the skin temperature in the area returned to normal. Importantly, objective medical evaluation through ultrasonography indicated that the previously detected gallstone was no longer present. This finding represents a substantial clinical improvement and provides additional evidence supporting the effectiveness of the treatment approach implemented during the study period.

Interpretation of Findings in the Context of Traditional Chinese Medicine

The clinical improvements observed in this case can be interpreted through the theoretical framework of Traditional Chinese Medicine. According to TCM theory, sharp pain in the hypochondrium accompanied by nausea, a bitter taste in the mouth, and a greasy yellow tongue coating is commonly associated with the syndrome known as Damp-Heat in the Liver and Gallbladder (Gan Dan Shi Re).This pathological condition occurs when dampness and heat accumulate in the Liver–Gallbladder system, obstructing the normal flow of Qi and interfering with the secretion and excretion of bile. The obstruction of Qi flow results in pain, digestive disturbances, and systemic manifestations such as fatigue and irritability. In more severe cases, prolonged stagnation may lead to the formation of gallstones.The findings of this study are consistent with this theoretical explanation. The participant initially exhibited classic symptoms of damp-heat stagnation, including sharp hypochondriac pain, bitter taste, nausea, greasy yellow tongue coating, and a wiry rapid pulse.

These symptoms strongly supported the diagnosis of Damp-Heat in the Liver and Gallbladder, as described in Chinese Medicine literature [9].The improvement observed after acupuncture therapy suggests

that the treatment successfully addressed the underlying pathological mechanism. By stimulating specific acupuncture points associated with the Liver and Gallbladder meridians, the therapy likely helped to clear heat, eliminate dampness, and restore the smooth flow of Qi.This interpretation aligns with the fundamental therapeutic principle in TCM, which emphasizes restoring balance and removing pathogenic factors rather than merely suppressing symptoms. When Qi circulation is restored and pathogenic damp-heat is eliminated, organ function gradually returns to normal, resulting in symptom relief and functional recovery.

Discussion of Acupuncture Diagnosis

Based on the initial clinical findings, the acupuncture diagnosis established during the first therapy session was cholecystitis with Damp-Heat syndrome affecting the Liver and Gallbladder. This diagnosis was supported by multiple diagnostic indicators, including sharp hypochondriac pain, nausea, bitter taste in the mouth, greasy yellow tongue coating, and a wiry rapid pulse.Local examination findings also supported this diagnosis. Tenderness in the hypochondrium region and increased skin temperature indicated the presence of localized inflammation and Qi stagnation. In TCM theory, these findings are characteristic of heat and stagnation affecting the Liver–Gallbladder system.At the sixth therapy session, the diagnosis remained the same in principle, as the underlying condition was still categorized within the Damp-Heat syndrome framework. However, the severity of the syndrome had clearly decreased. The reduction in symptoms and improvement in clinical indicators demonstrated that the pathogenic factors had been significantly reduced and the body's functional balance was gradually being restored.This diagnostic progression illustrates an important concept in TCM clinical practice: syndromes often persist during the recovery phase but appear in a milder form as treatment progresses. Therefore, continued therapy may be required to fully eliminate residual pathogenic factors and prevent recurrence.

Discussion of Acupuncture Therapy

The acupuncture treatment applied in this study followed a therapeutic strategy aimed at clearing heat, eliminating dampness, regulating Liver and Gallbladder Qi, and relieving pain. The selection of acupuncture points reflected these treatment principles.GB24 (Riyue), the Front-Mu point of the Gallbladder, was used to regulate gallbladder function and reduce inflammation in the hypochondrium region. This point is commonly used in TCM practice for disorders involving the gallbladder and biliary system.GB34 (Yanglingquan), the He-Sea point of the Gallbladder meridian, was selected to regulate Qi flow in the Liver–Gallbladder system and relieve hypochondriac pain. This point is widely recognized for its role in treating biliary disorders and musculoskeletal tension associated with Liver Qi stagnation.LR14 (Qimen), the Front-Mu point of the Liver, was used to regulate Liver Qi and reduce stagnation. This point plays an important role in addressing emotional and digestive symptoms associated with Liver imbalance.LI11 (Quchi) was included to clear heat from the body and reduce inflammatory processes. This point is frequently used in conditions involving internal heat and inflammatory disorders.SP9 (Yinlingquan) was selected for its ability to eliminate dampness and regulate fluid metabolism. Since dampness is a key pathogenic factor in this syndrome, the inclusion of this point was essential for restoring systemic balance.Finally, ST36 (Zusanli) was used as a tonifying point to strengthen digestive function and support the body's overall vitality.

This point helps harmonize the Spleen and Stomach, improving the body's ability to transform and transport fluids.The therapeutic results observed in this study support the theoretical basis of this treatment approach. By combining points that address both local and systemic pathological mechanisms, the therapy was able to reduce inflammation, relieve pain, and improve digestive function.These findings are consistent with previous research on acupuncture for gallbladder disorders. Wu et al. [8] and Chen et al. [9] explain that acupuncture protocols for Damp-Heat syndrome in the Liver and Gallbladder typically involve combinations of points designed to clear heat, eliminate dampness, and regulate bile flow. The points used in this study correspond closely with these recommendations.Furthermore, the improvement in the participant's condition may also be explained through physiological mechanisms related to acupuncture stimulation. Acupuncture has been shown to influence autonomic nervous system activity, improve microcirculation, and regulate gastrointestinal function. These effects may contribute to reduced inflammation, improved bile secretion, and relaxation of biliary tract muscles.As a result, obstruction within the gallbladder may gradually decrease,

allowing bile to flow more freely. This process may explain the disappearance of gallstones observed in the participant's ultrasound results after treatment.

Implications of the Findings

The findings of this case study highlight the potential role of acupuncture as a complementary therapeutic approach for managing cholecystitis-related abdominal pain. The integration of traditional diagnostic methods and targeted acupuncture therapy allowed for a comprehensive treatment approach addressing both symptoms and underlying pathological mechanisms.Although this study involved only a single participant, the results provide valuable insights into how acupuncture therapy may support recovery in patients with gallbladder disorders. The improvements observed in pain levels, digestive symptoms, physical examination findings, and ultrasound results suggest that acupuncture may contribute to both symptomatic relief and functional recovery.These findings also reinforce the importance of lifestyle factors in gallbladder health. The participant's dietary habits likely contributed to the development of the condition, and improvements in diet and lifestyle may have supported the therapeutic effects of acupuncture.

IV. CONCLUSION

This study demonstrates that the implementation of acupuncture care for a patient with right upper abdominal pain associated with cholecystitis resulted in a clear improvement in both subjective complaints and objective clinical findings. The acupuncture intervention contributed to the gradual reduction and eventual resolution of the main symptom of right upper abdominal pain, accompanied by a marked decrease in related symptoms such as nausea, parietal headache, and radiating pain to the scapula. Objective examinations also indicated improvement in physiological indicators, reflected in more balanced tongue and pulse conditions as well as the disappearance of previously detected gallstones on ultrasound examination. These findings indicate that acupuncture care, applied according to the diagnostic framework and therapeutic principles of Traditional Chinese Medicine, can support the regulation of physiological function and the alleviation of symptoms associated with gallbladder inflammation. Therefore, this case study contributes practical clinical insight into the potential role of acupuncture as a complementary therapeutic approach in managing abdominal pain related to cholecystitis and provides a preliminary reference for further research and clinical application in similar cases.

REFERENCES

[1] Fitriyasti, B., Khomaini, Rifqi, A., & Ferilda, S. (2025). Karakteristik pasien kolelitiasis di Rumah Sakit Siti Rahmah Padang pada tahun 2022. ***Jurnal [Nama Lengkap Jurnal].*** https://jurnal.syedzasaintika.ac.id

[2] Amaliya, A. R., Salsabila, R. K., Wicaksono, T. B., Christian, S., Azizaturrahmah, G. A., Sepestian, G. S. R., & Pintaningrum, Y. (2023). Komplikasi kolesistitis: Empiema dan hidrops kandung empedu. ***Unram Medical Journal,*** 12(4), 429–433. https://doi.org/10.29303/jku.v12i4.985

[3] Luki, D., & Muhammad, A. (2024). Pengaruh waktu dan penyimpanan bakteri standar Eschericia coli dengan zona hambat antibiotik gentamicin. Berkala Ilmiah Kedokteran dan Kesehatan Masyarakat, 2(2).

[4] Anggara, J. D. (2023). Hubungan antara jumlah batu empedu dengan gambaran klinis pada pasien kolelitiasis: Tinjauan terhadap derajat nyeri kolik bilier, durasi nyeri kolik bilier, tingkat mual, tingkat muntah, kejadian dispepsia, kejadian ikterus, dan kejadian demam [Skripsi, Universitas Lambung Mangkurat].

[5] Sugiharto, S., Budianto, A., Siswardana, D. R., & Sulistyo, H. (2016). Penyakit-penyakit pada kantong empedu dan salurannya. Educacao e Sociedade, 1(1), 1689–1699.

[6] Dewi, Y. S., & Yusmaidi, Y. (2024). Sebuah laporan kasus: Cholelithiasis dengan cholesystitis akut pada laki-laki 27 tahun. Medula, 14(3), 447–453.

[7] Mencarini, L., Vestito, A., Zagari, R. M., & Montagnani, M. (2024). The diagnosis and treatment of acute cholecystitis: A comprehensive narrative review for a practical approach. ***Journal of Clinical Medicine***, 13(9).

[8] Wu, F., Liu, W., Feng, H., Long, L., Hou, L., & Hou, C. (2020). Application of traditional Chinese medicines in postoperative abdominal adhesion. Evidence-Based Complementary and Alternative Medicine, 2020.

[9] Chen, Q., Zhang, Y., Li, S., Chen, S., Lin, X., Li, C., & Asakawa, T. (2019). Mechanisms underlying the prevention and treatment of cholelithiasis using traditional Chinese medicine. Evidence-Based Complementary and Alternative Medicine, 2019. https://doi.org/10.1155/2019/2536452.