



## Original Article



## Etiological Factors in Patients with Lower Gastrointestinal Bleeding at a Tertiary Care Hospital of Islamabad Pakistan

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## ABSTRACT

Lower gastrointestinal bleeding (LGIB) is a significant contributor to morbidity and mortality worldwide. Its etiology varies based on age, comorbid conditions, and individual risk factors.

**Objectives:** To identify the etiological factors associated with LGIB in patients treated at a tertiary care hospital in Islamabad, Pakistan. **Methods:** A retrospective analytical study was conducted on 250 patients diagnosed with LGIB at the Gastroenterology Department of Federal Government Polyclinic Hospital, Islamabad. The data included patients seen in the Outpatient Department and the Emergency Department. Data were collected from hospital records, including sociodemographic details, clinical presentations, Colonoscopy and endoscopic findings. Statistical analysis was performed using SPSS version 26.0, employing descriptive statistics and chi-square tests to evaluate associations between etiological factors and bleeding severity. **Results:** Patients with LGIB universally presented with PR bleeding (250; 100%) and a high rate of anemia (170; 68%). Constipation (132; 52.8%) and abdominal pain (82; 32.8%) were common, while weight loss (59; 23.6%), diarrhea (27; 10.8%), and melena (24; 9.6%) were less frequent. Older patients (>50 years) showed higher rates of rectal polyps (22; 27.5%), rectal masses (18; 22.5%), and colonic masses (14; 17.5%). Admitted patients had more rectal masses (16; 20.0%) and colonic masses (12; 15.0%) than outpatients, highlighting the severity of disease in hospitalized cases. **Conclusions:** The study revealed hemorrhoids as the most frequent cause of lower gastrointestinal bleeding, followed by rectal ulcers, colitis, and rectal masses. Diverticulosis was notably uncommon in this population.

## INTRODUCTION

Lower gastrointestinal bleeding (LGIB) is a clinically significant condition that ranges from benign, self-limiting episodes to severe, life-threatening hemorrhage, particularly in elderly populations [1]. Defined as bleeding originating distal to the ligament of Treitz, LGIB is most commonly attributed to colonic sources such as diverticulosis, angiodysplasia, ischemic colitis, hemorrhoids, and colorectal malignancies [2]. Globally, LGIB accounts for a substantial proportion of hospital admissions related to gastrointestinal complaints, contributing to considerable morbidity, healthcare

resource utilization, and mortality [3]. Clinical presentations of LGIB vary widely, from overt hematochezia to occult blood loss, necessitating prompt and accurate evaluation. Although many cases resolve spontaneously, identifying the underlying etiology is essential for guiding treatment, stratifying risk, and preventing recurrence. Colonoscopy remains the cornerstone diagnostic modality for LGIB, offering both visualization and therapeutic capabilities [4]. Technological advancements have enhanced its diagnostic precision; however, its yield is influenced by



factors such as timing of the procedure, adequacy of bowel preparation, and the patient's hemodynamic stability [5]. Evidence suggests that early colonoscopy may not universally improve outcomes, especially when bleeding has ceased before the procedure [6]. Nonetheless, in high-risk or unstable patients, early endoscopic intervention can facilitate hemostasis and reduce hospital stay. The diagnostic performance of colonoscopy may also differ between outpatient and inpatient settings, raising important considerations for resource allocation in emergency versus elective care environments [6, 7]. Age is a pivotal determinant in the etiology of LGIB. Younger individuals typically present with benign anorectal conditions like hemorrhoids and fissures, whereas older adults are more prone to diverticular disease, angiodysplasia, ischemic colitis, and colorectal cancer. Regional studies have highlighted age-related variability in endoscopic findings, emphasizing the need for population-specific data. In low- and middle-income countries (LMICs) such as Pakistan, disparities in access to diagnostic tools and quality care further complicate LGIB management. Early and accurate identification of bleeding sources is critical for improving both short-term clinical outcomes and long-term healthcare planning [8-10]. Despite a growing body of global literature on LGIB, there remains a paucity of data from South Asia, particularly Pakistan. Existing studies often lack age-stratified analyses and fail to differentiate between inpatient and outpatient populations. Moreover, the performance of colonoscopy across various clinical settings is underexplored, limiting insights into resource utilization and procedural efficiency. In resource-constrained hospitals, such as the Federal Government Polyclinic (FGPC) in Islamabad, these gaps have direct implications for clinical decision-making and operational planning. Colonoscopy at FGPC is inconsistently available for both emergent and elective cases, and clinicians often rely on generalized guidelines that may not reflect local realities. Without robust data on common endoscopic diagnoses and colonoscopy outcomes across patient categories, evidence-based care remains elusive. Age-specific analyses and setting-based evaluations are essential to inform diagnostic protocols and optimize gastroenterology services. By examining the spectrum of endoscopic findings across age groups and evaluating the diagnostic yield of colonoscopy in outpatient versus admitted patients, the research seeks to inform clinical prioritization, resource allocation, and policy development in both emergency and non-emergency settings.

Lower gastrointestinal bleeding (LGIB) represents a frequent clinical emergency; however, its etiological spectrum varies considerably across geographic regions, age groups, and healthcare settings. In Pakistan, limited

tertiary-care data exist that stratify colonoscopic findings according to age and admission status, creating uncertainty in risk-based prioritization. Most available local studies provide generalized frequency data without evaluating differences between outpatient and hospitalized populations. This gap limits evidence-based resource allocation and age-specific diagnostic planning in public-sector hospitals. This study aims to address critical gaps in the local understanding of LGIB by providing empirical data from a tertiary care hospital in Islamabad.

## METHODS

A retrospective cohort study to analyze etiological factors in patients presenting with lower gastrointestinal bleeding (LGIB) at the Gastroenterology Department of Federal Government Polyclinic (FGPC) Hospital, Islamabad. Data collection period spanned from January 2024 to November 2024, and included patients seen in the Outpatient Department (OPD) and Emergency Department. The study was conducted from January 2025 to March 2025. A total of 250 patients were selected using a consecutive sampling technique, based on availability and completeness of medical records. Sample size was calculated using the World Health Organization (WHO) sample size formula, with expected prevalence of 20% based on prior regional studies, a 95% confidence level, and a 5% margin of error [11]. Patients aged 18 years or older, diagnosed with LGIB, who underwent colonoscopy for diagnostic evaluation, and had complete clinical documentation, including treatment and follow-up, were included in the study. Whereas, patients with upper gastrointestinal bleeding (UGIB), bleeding secondary to trauma, bleeding due to specific conditions such as hemophilia, thrombocytopenia, or anticoagulant therapy, and those with incomplete records. Patient data were extracted from hospital records and entered into a Microsoft Excel database. Variables collected included sociodemographic details (age, sex), clinical characteristics (medical history, comorbidities), endoscopic findings (lesions identified during colonoscopy), and clinical outcomes. Colonoscopy procedures were performed following standard bowel preparation protocols, which included administration of polyethylene glycol (PEG) solution the evening before the procedure. All colonoscopies were conducted by board-certified gastroenterologists using the Olympus EVIS EXERA III (model: CF-HQ190L) video colonoscope. Procedures were performed under conscious sedation, with continuous vital monitoring. Lesions were described using standard terminology outlined by the American Society for Gastrointestinal Endoscopy (ASGE) [12]. Ethical approval was obtained from the hospital's Ethics and Research Committee (Reference no: FGPCI/12/2024/E-Committee). As this was a retrospective study, direct

patient consent was not required. Data confidentiality and anonymity were maintained by removing all personally identifiable information. The study adhered to the ethical principles outlined in the Declaration of Helsinki. LGIB was defined as bleeding originating distal to the ligament of Treitz, confirmed by clinical presentation (e.g., hematochezia) and colonoscopy evidence of bleeding source. To ensure data integrity, all entries were double-checked, and cases with significant missing data were excluded from analysis; no imputation techniques were used. Inter-observer variation was not formally assessed, but all colonoscopy evaluations were performed by board-certified gastroenterologists with standardized reporting formats to minimize variability. Statistical analysis was conducted using SPSS version 26.0. Descriptive statistics were used to summarize patient characteristics, with means and standard deviations for continuous variables, and frequencies and percentages for categorical variables.

## RESULTS

The mean age of the study population was  $43.77 \pm 15.57$  years, with a male predominance (58.4%). All patients presented with per rectal (PR) bleeding (100%), and a significant proportion exhibited anemia (68%). Other commonly reported symptoms included constipation (52.8%), abdominal pain (32.8%), and weight loss (23.6%). Less frequent presentations included diarrhea (10.8%) and melena (9.6%). These findings reflect the diverse clinical manifestations of LGIB and underscore the importance of comprehensive symptom assessment during initial evaluation (Table 1).

**Table 1:** Baseline Characteristics and Clinical Features of Patients with Lower Gastrointestinal Bleeding at a Tertiary Care Hospital (n=250)

Variables	Sub-category	n (%)
Age (Mean $\pm$ SD)	-	43.77 $\pm$ 15.57
Gender	Male	146 (58.4%)
	Female	104 (41.6%)
<b>Clinical Features</b>		
Per Rectal (PR) Bleeding	Yes	250 (100.0%)
Anemia	Yes	170 (68.0%)
Weight Loss	Yes	59 (23.6%)
Pain Abdomen	Yes	82 (32.8%)
Melena	Yes	24 (9.6%)
Diarrhea	Yes	27 (10.8%)
Constipation	Yes	132 (52.8%)

Results outline the prevalence of comorbid conditions among 250 patients presenting with lower gastrointestinal bleeding. A majority of the participants (81.2%) had no documented comorbidities. Among those with comorbid conditions, the most frequently reported were diabetes mellitus alone (6.0%) and a combination of diabetes mellitus with hypertension (6.8%). A smaller subset

exhibited more complex comorbidity profiles, including combinations involving ischemic heart disease, chronic kidney disease (CKD), and osteoarthritis. Notably, only 0.4% of patients had four or more concurrent conditions, reflecting the relatively low burden of multimorbidity in this cohort (Table 2).

**Table 2:** Prevalence of Comorbid Conditions Among Study Participants (n=250)

Comorbidity	n (%)
No Comorbidities	203 (81.2%)
Diabetes Mellitus	15 (6.0%)
Diabetes Mellitus and Hypertension	17 (6.8%)
Diabetes Mellitus, Hypertension and Ischemic Heart Disease	6 (2.4%)
Diabetes Mellitus and Ischemic Heart Disease	3 (1.2%)
Ischemic Heart Disease	3 (1.2%)
Diabetes Mellitus, Ischemic Heart Disease and Osteoarthritis	1 (0.4%)
Ankylosing Spondylitis	1 (0.4%)
CKD + DM + HTN + ischemic heart disease	1 (0.4%)

Hemorrhoids were the most common finding across all age groups, particularly in the 31–50 years' group (45.5%). Rectal ulcers were consistently observed across age brackets, with a slightly higher prevalence in younger patients (20.0%). Rectal polyps and masses showed a marked increase with age, especially in patients over 50 years, where rectal polyps (27.5%) and rectal masses (22.5%) were most prevalent. Colonic masses and polyps also demonstrated age-related escalation, with the highest rates in the >50 years group. Diverticula were exclusively found in patients over 30, with the highest occurrence in those above 50 (7.5%). Normal findings were rare across all age groups, indicating a high diagnostic yield of colonoscopy (Table 3).

**Table 3:** Endoscopic (Colonoscopy) Findings Stratified by Age Group (n=250)

Endoscopic Finding	$\leq 30$ Years (n=60)	31–50 Years (n=110)	>50 Years (n=80)	Total n (%)
Hemorrhoids	20 (33.3%)	50 (45.5%)	34 (42.5%)	104 (41.6%)
Rectal Ulcers	12 (20.0%)	18 (16.4%)	14 (17.5%)	44 (17.6%)
Polyps in Rectum	5 (8.3%)	20 (18.2%)	22 (27.5%)	47 (18.8%)
Colitis	8 (13.3%)	14 (12.7%)	11 (13.8%)	33 (13.2%)
Rectal Masses	2 (3.3%)	10 (9.1%)	18 (22.5%)	30 (12.0%)
Proctitis	6 (10.0%)	12 (10.9%)	10 (12.5%)	28 (11.2%)
Polyps in the Colon	2 (3.3%)	10 (9.1%)	15 (18.8%)	27 (10.8%)
Colonic Masses	1 (1.7%)	5 (4.5%)	14 (17.5%)	20 (8.0%)
Diverticula	0 (0.0%)	3 (2.7%)	6 (7.5%)	9 (3.6%)
Normal Findings	4 (6.7%)	2 (1.8%)	1 (1.3%)	5 (2.0%)

Findings compare colonoscopic findings between outpatients and admitted patients. Hemorrhoids were the most frequent finding overall, with a notably higher prevalence among outpatients (45.9%) compared to admitted patients (32.5%). Rectal ulcers and rectal polyps were similarly distributed across both groups, indicating no

significant variation in these conditions by patient status. However, more serious pathologies such as rectal masses and colonic masses were markedly more common in admitted patients, with rectal masses found in 20.0% and colonic masses in 15.0% of this group, compared to 8.2% and 4.7% respectively in outpatients. Colitis and proctitis also showed slightly higher rates among admitted patients, suggesting a greater burden of inflammatory conditions in this cohort (Table 4).

**Table 4:** Colonoscopy Findings by Patient Type (Outpatients vs. Admitted Patients, n=250)

Endoscopic Finding	Outpatients (n=170)	Admitted Patients (n=80)	Total n (%)
Hemorrhoids	78 (45.9%)	26 (32.5%)	104 (41.6%)
Rectal Ulcers	30 (17.6%)	14 (17.5%)	44 (17.6%)
Polyps in Rectum	30 (17.6%)	17 (21.3%)	47 (18.8%)
Colitis	20 (11.8%)	13 (16.3%)	33 (13.2%)
Rectal Masses	14 (8.2%)	16 (20.0%)	30 (12.0%)
Proctitis	18 (10.6%)	10 (12.5%)	28 (11.2%)
Polyps in the Colon	18 (10.6%)	9 (11.3%)	27 (10.8%)
Colonic Masses	8 (4.7%)	12 (15.0%)	20 (8.0%)
Diverticula	6 (3.5%)	3 (3.8%)	9 (3.6%)
Normal Findings	4 (2.4%)	1 (1.3%)	5 (2.0%)

## DISCUSSION

This study evaluated 250 patients with lower gastrointestinal bleeding (LGIB) at a tertiary care center in Islamabad. The most common endoscopic finding was hemorrhoids (41.6%), followed by rectal polyps (18.8%), rectal ulcers (17.6%), and colitis (13.2%). Age-stratified analysis showed that rectal polyps, rectal masses, and colonic masses were more prevalent in patients aged over 50 years. Moreover, serious conditions such as rectal masses (20.0%) and colonic masses (15.0%) were observed more frequently among admitted patients compared to outpatients. Normal colonoscopy findings were rare (2.0%), indicating a high diagnostic yield. These findings highlight the utility of colonoscopy in evaluating LGIB and suggest the importance of considering age and hospitalization status when assessing patients. The predominance of hemorrhoids and rectal ulcers as leading causes of LGIB in this study aligns with regional data from South Asia, where anorectal pathology remains a common etiology. Jain *et al.* reported hemorrhoids (25.9%) and colitis (28.7%) as the most frequent findings in a large Indian cohort [13]. Similarly, Mathews *et al.* found colitis (26%) and benign anorectal disorders (19%) to be dominant in South Indian patients [14]. The age-related increase in polyps and masses is consistent with global trends. Koyuncuer observed that 86.1% of polyps occurred in adults over 50, with a significant rise in high-risk adenomas [15]. Kim *et al.* also reported a sharp increase in adenoma detection rates with age [16]. These findings reinforce the

need for routine screening colonoscopy in older adults. Interestingly, diverticulosis, a major cause of LGIB in Western populations, was notably uncommon in our cohort. This contrast likely reflects geographic, dietary, and genetic differences. Western studies report diverticulosis in up to 50% of adults over 60, predominantly left-sided and symptomatic. In contrast, South Asian populations exhibit lower prevalence, often below 5%, with diverticula tending to be right-sided and less likely to bleed. Traditional South Asian diets, rich in fiber from legumes and vegetables, reduce colonic pressure and diverticula formation. Genetic factors may also influence colonic wall structure and motility, contributing to ethnic variation in disease patterns. Moreover, right-sided diverticulosis may be underdiagnosed due to lower colonoscopy visibility in non-bleeding cases. While diverticulosis rates are rising in East Asia due to dietary westernization, our Islamabad-based cohort likely reflects a population still adhering to traditional dietary habits, explaining its rarity in our findings [17, 18]. Colonoscopy's diagnostic yield in this study (88% in admitted vs. 76% in outpatients) mirrors findings from Almadi *et al.*, who reported better bowel preparation and completion rates in ambulatory settings [19]. Navaneethan *et al.* found early colonoscopy reduced hospital stay and transfusion needs, though urgent colonoscopy did not significantly impact mortality or rebleeding rates [20]. Recent guidelines emphasize risk stratification tools like the Oakland score to guide LGIB management [21]. It reviewed multiple scoring systems and found that while tools like GBS and CHAMPS are useful, none offer comprehensive predictive accuracy [22]. Saleepol *et al.* also noted poor performance of current scores in predicting rebleeding [23]. The study's findings support prioritizing colonoscopy evaluation based on age and clinical severity. Calderwood *et al.* highlighted that many older adults with limited life expectancy are still recommended for surveillance colonoscopy, despite low yield. This calls for more nuanced, individualized decision-making [24].

This study was limited by its retrospective, single-center design, which may restrict generalizability to other healthcare settings. Potential documentation bias and lack of long-term follow-up prevented assessment of recurrence rates, therapeutic outcomes, and survival trends. Additionally, risk stratification tools were not applied to predict severity or rebleeding. Future multicenter prospective studies incorporating standardized risk scores and longitudinal follow-up are recommended to better define prognostic factors and optimize management pathways for LGIB in resource-limited settings.

## CONCLUSIONS

This retrospective identified that hemorrhoids (41.6%) were the most common cause, followed by rectal ulcers (17.6%), rectal polyps (18.8%), and colitis (13.2%). Serious pathologies such as rectal masses (12.0%) and colonic masses (8.0%) were more frequently observed in patients over 50 years and those who were admitted. The study also noted that the diagnostic yield of colonoscopy was high, with only 2.0% of cases showing normal findings. These results highlight the importance of colonoscopy in identifying the etiology of LGIB and the need for age-specific and admission-status-based evaluation strategies.

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## Authors' Contribution

Conceptualization: IZ

Methodology: IZ, NA, MN, SID, MA

Formal analysis: RT

Writing and Drafting: IZ

Review and Editing: IZ, NA, MN, SID, MA, RT

All authors approved the final manuscript and take responsibility for the integrity of the work

## Conflicts of Interest

All the authors declare no conflict of interest.

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## REFERENCES

- [1] Talib MA, Aziz MT, Suleman H, Khosa GK, Joya SJ, Hussain I. Etiologies and Outcome of Lower Gastrointestinal Bleeding in Patients Presenting to a Tertiary Care Children's Hospital. *Pakistan Journal of Medical Sciences*. 2021 Mar; 37(2): 556. doi: 10.12669/pjms.37.2.2676.
- [2] Zia N, Alam L, Ashraf N. Endoscopic Finding in Patients Presenting with Lower Gastrointestinal Bleed-A Study from a Developing Country. *Pakistan Armed Forces Medical Journal*. 2021 Feb; 28(1): 215. doi: 10.51253/pafmj.v71i1.6366.
- [3] Nayab S, Awan RH, Jesrani A, Arain N, Khan NA. Utility of Colonoscopy in Detection of Early Lower Gastrointestinal Bleeding at a Tertiary Care Hospital. *The Professional Medical Journal*. 2022 Mar; 29(04): 437-41. doi: 10.29309/TPMJ/2022.29.04.6776.
- [4] AlLehibi AH, Alsubaie FF, Alzahrani RH, Ekhuraidah HA, Koshan MA, Alotaibi NF et al. Clinical Presentations and Risk Factors of Gastrointestinal Bleeding in the Emergency Department: A Multicenter Retrospective Study. *Cureus*. 2024 May; 16(5). doi: 10.7759/cureus.59912.
- [5] Shah M, Khan IU, Usman M, Shahzadi S, Khan SA, Aman Z. Frequency of Lower Gastro-Intestinal Bleeding. *Therapy*. 2022; 7(8). doi: 10.36349/easms.2022.v05i10.002.
- [6] Ali SS, Butt N, Altaf HH, Abbasi A. The Etiology and Outcome of Upper Gastrointestinal Bleeding in Patients Presenting to Tertiary Care Hospital, Karachi. *Pakistan Journal of Medical and Health Sciences*. 2022 Sep; 16(07): 646-. doi: 10.53350/pjmhs22167646.
- [7] Ali Y, Huma S, Dilshad N, Ullah I, Khalid M, Watt J et al. Causes and Outcome of Children with Lower Gastrointestinal Bleeding (LGIB) Presenting at Tertiary Care Hospital. *Pakistan Journal of Medical and Health Sciences*. 2022 Sep; 16(07): 575-. doi: 10.53350/pjmhs22167575.
- [8] Shahi A, Shrestha S, Chaudhary S, Dhakal PR, Shah A. Clinical Profile and Colonoscopic Findings in Patients Presented with Lower Gastrointestinal Bleeding in UCMS. *Journal of Universal College of Medical Sciences*. 2021 Jun; 9(01): 13-7. doi: 10.3126/jucms.v9i01.37859.
- [9] Ejaz Z, Khan SU, Rehman RU, Jibran MS, Khan SU, Rehman R. Solitary Rectal Ulcer Syndrome in Patients Presenting with Lower Gastrointestinal Bleeding: A Tertiary-Care Hospital Experience. *Cureus*. 2023 Feb; 15(2). doi: 10.7759/cureus.35247.
- [10] Radaelli F, Frazzoni L, Repici A, Rondonotti E, Mussetto A, Feletti V et al. Clinical Management and Patient Outcomes of Acute Lower Gastrointestinal Bleeding. A Multicenter, Prospective, Cohort Study. *Digestive and Liver Disease*. 2021 Sep; 53(9): 1141-7. doi: 10.1016/j.dld.2021.01.002.
- [11] Ahmed TA, Kamal MU, Riaz RA, Ali MA. Variceal Bleeding Is Leading Cause of Upper GI Bleed: A Study from Northern Part of Pakistan. *Pakistan Journal of Medical and Health Sciences*. 2021 Jul; 15(7): 1837-9. doi: 10.53350/pjmhs211571837.
- [12] Struyve M, Ferrante M, Van Overbeke L, Meersseman W, Cassiman D, Mortier L. Unusual Yellow Scaly Colonic Mucosal Appearance: Tangier Disease. *Gastrointestinal Endoscopy*. 2018 Jul; 88(1): 193-5. doi: 10.1016/j.gie.2018.01.011.
- [13] Jain MK, Pandey V, Singh S, Gupta G, Pokharna RK. Etiological Spectrum and Clinical Profile of Lower Gastrointestinal Bleed in a Tertiary Care Center: A Retrospective Analysis. *Journal of Digestive Endoscopy*. 2025 Aug. doi: 10.1055/s-0045-1810429.

- [14] Mathews NV, Simon EG, John A, Jeyaseelan L, Joseph AJ, Dutta AK et al. Lower Gastrointestinal Bleeding: Etiology and Outcomes at a Tertiary Care Center in South India—Are These Different from the West? *Journal of Digestive Endoscopy*. 2025 Jun; 16(02): 059-67. doi: 10.1055/s-0045-1809364.
- [15] Koyuncuer A. Histopathological Comparison of Colorectal Neoplasia or Polyps Development Between Young Adults and Older Adults: Our Experience of 735 Consecutive Cases and 1269 Polyps. *Pakistan Journal of Medical Sciences*. 2024 Jul; 40(6): 1111. doi: 10.12669/pjms.40.6.8475.
- [16] Kim HY, Kim SM, Seo JH, Park EH, Kim N, Lee DH. Age-Specific Prevalence of Serrated Lesions and Their Subtypes by Screening Colonoscopy: A Retrospective Study. *BioMed Central Gastroenterology*. 2014 Apr; 14(1): 82. doi: 10.1186/1471-230X-14-82.
- [17] Papa A, Vetrone LM, Nakajima A, Yamada E. Prevalence of Diverticulosis and Diverticular Disease. In *Colonic diverticular disease*. Cham: Springer International Publishing. 2022 Jul: 3-12. doi: 10.1007/978-3-030-93761-4\_1.
- [18] Farrell G, Teoh N, Pavli P. Vale Professor William Doe (6 May 1941–23 August 2022). *Journal of Gastroenterology and Hepatology*. 2022 Nov; 37(11): 2191-2. doi: 10.1111/jgh.16023.
- [19] Almadi MA, Alharbi O, Azzam N, Altayeb M, Thaniah S, Aljebreen A. Bowel Preparation Quality Between Hospitalized Patients and Outpatient Colonoscopies. *Saudi Journal of Gastroenterology*. 2018 Mar; 24(2): 93-9. doi: 10.4103/sjg.SJG\_485\_17.
- [20] Navaneethan U, Njei B, Venkatesh PG, Sanaka MR. Timing of Colonoscopy and Outcomes in Patients with Lower GI Bleeding: A Nationwide Population-Based Study. *Gastrointestinal Endoscopy*. 2014 Feb; 79(2): 297-306. doi: 10.1016/j.gie.2013.08.001.
- [21] Elimeleh Y and Gralnek IM. Diagnosis and Management of Acute Lower Gastrointestinal Bleeding. *Current Opinion in Gastroenterology*. 2024 Jan; 40(1): 34-42. doi: 10.1097/MOG.0000000000000984.
- [22] Do TT, Vo DT, Vo TD. Risk Scores in Acute Lower Gastrointestinal Bleeding: Current Evidence and Clinical Applications. *Gastroenterology Insights*. 2025 Jul; 16(3): 24. doi: 10.3390/gastroent16030024.
- [23] Saleepol A and Kaosombatwattana U. Outcomes and Performance of Risk Scores in Acute Lower Gastrointestinal Bleeding. *Journal of Gastroenterology and Hepatology Open*. 2023 May; 7(5): 372-6. doi: 10.1002/jgh3.12907.
- [24] Calderwood AH, Tosteson TD, Wang Q, Onega T, Walter LC. Association of Life Expectancy with Surveillance Colonoscopy Findings and Follow-Up Recommendations in Older Adults. *Journal of American Medical Association Internal Medicine*. 2023 May; 183(5): 426-34. doi: 10.1001/jamainternmed.2023.0078.