JOURNAL OF THE EUROPEAN SOCIETY OF SURGERY 07/01/2026

# COLONOSCOPY FINDINGS AND PREDICTORS OF SIGNIFICANT COLORECTAL LESIONS IN ADULT PATIENTS

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**RESEARCH ARTICLE**
DOI:
https://doi.org/10.5281/zenodo.21008331

***Volume 1 Issue 2***

***July 2026***

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*Submitted 18 June 2026*

*Accepted 26 June 2026*

*Published 01 July 2026*

*Citation*
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*Vol 1: Iss 2, 2026.*

*The article was originally submitted in ENGLISH. Translations into other languages were reviewed and validated by the authors and the editorial team. Nevertheless, for the most accurate representation of the subject matter, readers are encouraged to consult the article in its original language.*



## Abstract

**Background:** Colorectal lesions include benign, premalignant, and malignant conditions. Colonoscopy is the key diagnostic and therapeutic tool for detecting significant colorectal lesions, especially in symptomatic patients. Identifying high-risk clinical predictors may help prioritize patients for early colonoscopic evaluation.

**Aim of the study:** This study aimed to assess colonoscopy findings and identify predictors of significant colorectal lesions among adult patients undergoing colonoscopy.

**Methods:** This prospective observational analytical study included 350 adult patients who underwent colonoscopy for lower gastrointestinal symptoms or screening at Prime Hospital, Dubai, UAE. The study was conducted from 2020 to 2023. Data on sociodemographic characteristics, clinical features, colonoscopy findings, lesion site, and histopathology were collected using a structured data sheet. Significant colorectal lesions included advanced adenoma, colorectal carcinoma, inflammatory bowel disease, large or multiple adenomatous polyps, and high-grade dysplasia. Data were analyzed using SPSS version 26, and $p<0.05$ was considered statistically significant.

**Results:** Among 350 patients, the mean age was 49.2±13.6 years, and 196 (56.0%) were male. The common indications were altered bowel habit (43.1%), chronic abdominal pain (39.4%), and rectal bleeding (36.0%). Significant colorectal lesions were found in 105 (30.0%) patients. The common findings were colorectal polyp (23.4%), hemorrhoids (21.1%), and suspected carcinoma (7.7%). Independent predictors of significant lesions were unexplained weight loss (AOR 3.25), positive fecal occult blood test (AOR 2.89), iron deficiency anemia (AOR 2.72), rectal bleeding, age >50 years, male sex, and altered bowel habit.

**Conclusion:** Significant colorectal lesions were common among adult patients undergoing colonoscopy. Age above 50 years, male sex, rectal bleeding, altered bowel habit, unexplained weight loss, iron deficiency anemia, and positive fecal occult blood test were important predictors. Early risk-based colonoscopic evaluation may help improve detection of premalignant and malignant colorectal lesions.

**Keywords:** Colonoscopy, Colorectal lesions, Colorectal polyps, Colorectal cancer, and Predictors.

## Introduction:

Colorectal lesions include a wide range of abnormalities, from benign conditions such as hemorrhoids and inflammatory changes to premalignant adenomas, advanced adenomas, inflammatory bowel disease, and colorectal carcinoma. Significant colorectal lesions are clinically important because they often require biopsy, polypectomy, definitive treatment, surveillance, or oncological referral. Colonoscopy remains the gold standard investigation for direct visualization of the colon and rectum, allowing diagnosis, biopsy, and therapeutic intervention during the same procedure [1,2]. Early detection of advanced adenomas and colorectal cancer is particularly important because most colorectal cancers develop gradually through the adenoma-carcinoma sequence, providing an opportunity for prevention and early treatment [3,4].

Colorectal cancer is a major global health burden. In 2022, approximately 1.93 million new cases and more than 900,000 deaths were estimated worldwide, making it the third most commonly diagnosed cancer and the second leading cause of cancer-related mortality [1]. Its incidence and mortality vary according to geography, socioeconomic status, lifestyle patterns, screening availability, and access to healthcare [2]. In the United Arab Emirates (UAE), colorectal cancer is an important public health concern. GLOBOCAN 2022 estimated 550 new colorectal cancer cases and 236 deaths in the UAE, ranking colorectal cancer as the second most common cancer site among both sexes and the leading cancer site among males [5]. The UAE National Cancer Registry reported 413 cases of colorectal cancer in 2019, accounting for 9.4% of all malignant cancers [6]. These findings highlight the need for early detection, timely colonoscopy, and proper follow-up of colorectal lesions in UAE clinical practice.

Colonoscopy is not limited to cancer diagnosis; it is also essential for evaluating common lower gastrointestinal symptoms, including rectal bleeding, altered bowel habit, chronic abdominal pain, constipation, chronic diarrhea, iron-deficiency anemia, unexplained weight loss, and positive fecal occult blood or fecal immunochemical test [7-9]. UAE national colorectal cancer screening guidance recommends screening for eligible adults aged 40-75 years, using colonoscopy every 10 years or annual fecal immunochemical testing for average-risk individuals [7]. This screening approach reflects regional concern about colorectal cancer and supports the importance of colonoscopy in both diagnostic and preventive care.

Clinical predictors can help identify patients who are more likely to have significant colorectal lesions. Red-flag symptoms, especially rectal bleeding, anemia, abdominal pain, and altered bowel habit, have been associated with early-onset colorectal cancer and other important colonic diseases [10,11]. However, prediction models based on age, sex, symptoms, fecal testing, and blood parameters show variable performance across populations and healthcare settings [12,13]. In the UAE, limited hospital-based data are available on colonoscopy findings and independent predictors of significant colorectal lesions among adult patients. This gap is important because UAE hospitals serve both Emirati and expatriate populations with diverse demographic, lifestyle, and healthcare-access patterns.

Local UAE-based evidence is therefore needed to understand disease patterns, symptom presentation, screening uptake, bowel preparation quality, referral pathways, and histopathological outcomes. A hospital-based study can help clinicians recognize high-risk patients, improve diagnostic decision-making, promote timely referral, and ensure efficient use of colonoscopy services. Therefore, this study aimed to assess colonoscopy findings and identify clinical predictors of significant colorectal lesions among adult patients undergoing colonoscopy.

## Methods

This hospital-based prospective observational analytical study was conducted among adult patients who underwent colonoscopy for lower gastrointestinal symptoms or screening purposes at Prime Hospital, Dubai, UAE. The study was carried out after obtaining ethical approval from the institutional review board. A total of 350 patients were enrolled by consecutive sampling after fulfilling the selection criteria, during 3, from 2020 to 2022. Patients aged 18 years or above who underwent complete colonoscopic examination were included. Patients with incomplete colonoscopy, inadequate bowel preparation, previously diagnosed colorectal cancer, history of colorectal surgery, severe acute illness, bleeding diathesis, and incomplete clinical or histopathological records were excluded. Written informed consent was obtained from all participants before data collection.

Data were collected using a pre-designed structured data collection sheet. Sociodemographic variables included age, sex, residence, smoking status, family history of colorectal cancer, diabetes mellitus, and hypertension. Clinical variables included altered bowel habit, rectal bleeding, chronic abdominal pain, constipation, chronic diarrhea, unexplained weight loss, iron deficiency anemia, positive fecal occult blood test, screening colonoscopy, and previous history of colorectal polyp. Hemoglobin level was also recorded where available. All colonoscopies were performed by experienced endoscopists following standard bowel preparation protocol. Colonoscopic findings, including normal findings, hemorrhoids, colorectal polyps, suspected colorectal carcinoma, diverticulosis, inflammatory bowel disease, colitis or proctitis, ulcerative lesions, angiodysplasia, and other abnormalities, were recorded. The lesion's anatomical site was documented. Biopsy or polypectomy specimens were sent for histopathological examination when indicated. The primary outcome was the presence of significant colorectal lesions, defined as advanced adenoma, colorectal carcinoma, inflammatory bowel disease, large or multiple adenomatous polyps, high-grade dysplasia, or other clinically important lesions requiring treatment or follow-up.

Data were analyzed using SPSS version 26. Categorical variables were expressed as frequency and percentage, while continuous variables were expressed as mean ± standard deviation. Chi-square test, Fisher's exact test, and independent samples t-test were applied as appropriate. Multivariate logistic regression was performed to identify independent predictors. A p-value $<0.05$ was considered statistically significant.

## Results

The highest proportion of patients belonged to the 51–60 years age group, 91 (26.0%), followed by the 41–50 years age group, 82 (23.4%). The mean age was 49.2±13.6 years. Male patients were predominant (196, 56.0%), and most patients were from urban areas (210, 60.0%). Smoking history was present in 98 (28.0%) of patients, while family history of colorectal cancer was found in 31 (8.9%). Hypertension and diabetes mellitus were present in 81 (23.1%) and 64 (18.3%) patients, respectively.

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Age group (years) | 18–30 | 42 | 12.0 |
| | 31–40 | 70 | 20.0 |
| | 41–50 | 82 | 23.4 |
| | 51–60 | 91 | 26.0 |
| | >60 | 65 | 18.6 |
| | Mean ± SD | 49.2 ± 13.6 | |
| Sex | Male | 196 | 56.0 |
| | Female | 154 | 44.0 |
| Residence | Urban | 210 | 60.0 |
| | Rural | 140 | 40.0 |
| Smoking status | Smoker | 98 | 28.0 |
| | Non-smoker | 252 | 72.0 |
| Family history of colorectal cancer | Present | 31 | 8.9 |
| | Absent | 319 | 91.1 |
| Comorbidity | Diabetes mellitus | 64 | 18.3 |
| | Hypertension | 81 | 23.1 |

**Table 1.** Baseline Sociodemographic and Clinical Characteristics of the Study Patients (n=350)

Altered bowel habit was the most common indication, observed in 151 (43.1%) of patients, followed by chronic abdominal pain in 138 (39.4%) and rectal bleeding in 126 (36.0%). Constipation was reported by 96 patients (27.4%), while iron deficiency anemia was present in 59 patients (16.9%). Screening colonoscopy was performed in 58 (16.6%) patients. Positive fecal occult blood test and a previous history of colorectal polyp were less frequent, at 32 (9.1%) and 21 (6.0%), respectively.

| Indication / Symptom | Frequency (n) | Percentage (%) |
|---|---|---|
| Altered bowel habit | 151 | 43.1 |
| Chronic abdominal pain | 138 | 39.4 |
| Rectal bleeding | 126 | 36 |
| Constipation | 96 | 27.4 |
| Iron deficiency anemia | 59 | 16.9 |
| Screening colonoscopy | 58 | 16.6 |
| Chronic diarrhea | 54 | 15.4 |
| Unexplained weight loss | 47 | 13.4 |
| Positive fecal occult blood test | 32 | 9.1 |
| Previous history of colorectal polyp | 21 | 6 |

**Table 2.** Indications and Presenting Symptoms for Colonoscopy

The most common finding was colorectal polyp, detected in 82 patients (23.4%), followed by hemorrhoids in 74 patients (21.1%) and normal colonoscopy in 68 patients (19.4%). Colorectal mass or suspected carcinoma was found in 27 (7.7%) of patients. Among patients with colorectal lesions, the sigmoid colon was the most common site (62; 29.8%), followed by the rectum (54; 26.0%). Significant colorectal lesions were detected in 105 (30.0%) patients, with advanced adenoma being the most common (38; 10.9%), followed by colorectal carcinoma (27; 7.7%).

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|
| **Colonoscopy finding** | | |
| Normal colonoscopy | 68 | 19.4 |
| Hemorrhoids | 74 | 21.1 |
| Colorectal polyp | 82 | 23.4 |
| Colorectal mass / suspected carcinoma | 27 | 7.7 |
| Diverticulosis | 31 | 8.9 |
| Inflammatory bowel disease | 25 | 7.1 |
| Colitis / proctitis | 24 | 6.9 |
| Ulcerative lesion | 10 | 2.9 |
| Angiodysplasia | 6 | 1.7 |
| Others | 3 | 0.9 |
| **Site distribution among patients with colorectal lesions (n = 208)** | | |
| Rectum | 54 | 26.0 |
| Sigmoid colon | 62 | 29.8 |
| Descending colon | 21 | 10.1 |
| Transverse colon | 18 | 8.7 |
| Ascending colon | 24 | 11.5 |
| Cecum | 12 | 5.8 |
| Multiple sites | 17 | 8.2 |
| **Significant colorectal lesion type (n = 105)** | | |
| Advanced adenoma | 38 | 10.9 |
| Colorectal carcinoma | 27 | 7.7 |
| Inflammatory bowel disease | 25 | 7.1 |
| High-risk / multiple adenomatous polyps | 15 | 4.3 |

**Table 3.** Colonoscopy Findings and Site Distribution of Lesions

Patients with significant lesions were more commonly aged >50 years compared with those without significant lesions, 64.8% versus 35.9%, p<0.001. Male sex was also significantly higher in the significant lesion group, 69.5% versus 50.2%, p=0.001. Rectal bleeding, altered bowel habit, unexplained weight loss, iron deficiency anemia, positive fecal occult blood test, family history of colorectal cancer, and smoking history were all significantly associated with colorectal lesions. The mean hemoglobin level was lower among patients with significant lesions (10.4±1.8 g/dl) than among those without significant lesions (12.1±1.6 g/dl), p<0.001.

| Variable | Significant lesion present (n = 105) | Significant lesion absent (n = 245) | p-value |
|---|---|---|---|
| Age >50 years | 68 (64.8) | 88 (35.9) | <0.001 |
| Male sex | 73 (69.5) | 123 (50.2) | 0.001 |
| Rectal bleeding | 56 (53.3) | 70 (28.6) | <0.001 |
| Altered bowel habit | 61 (58.1) | 90 (36.7) | <0.001 |
| Unexplained weight loss | 30 (28.6) | 17 (6.9) | <0.001 |
| Iron deficiency anemia | 32 (30.5) | 27 (11.0) | <0.001 |
| Positive fecal occult blood test | 19 (18.1) | 13 (5.3) | <0.001 |
| Family history of colorectal cancer | 16 (15.2) | 15 (6.1) | 0.006 |
| Smoking history | 43 (41.0) | 55 (22.4) | <0.001 |
| Hemoglobin level (g/dl) | 10.4 ± 1.8 | 12.1 ± 1.6 | <0.001 |

**Table 4.** Comparison between Patients with and Without Significant Colorectal Lesions

Unexplained weight loss was the strongest independent predictor (AOR 3.25, 95% CI 1.60–6.62, p=0.001), followed by positive fecal occult blood test (AOR 2.89, 95% CI 1.26–6.62, p=0.012), and iron deficiency anemia (AOR 2.72, 95% CI 1.43–5.18, p=0.002). Rectal bleeding, age >50 years, male sex, and altered bowel habit were also independent predictors of significant colorectal lesions. Family history of colorectal cancer and smoking history showed increased odds but did not reach statistical significance in the adjusted model.

| Predictor variable | Adjusted OR | 95% CI | p-value |
|---|---|---|---|
| Age >50 years | 2.35 | 1.42–3.89 | 0.001 |
| Male sex | 1.85 | 1.10–3.10 | 0.02 |
| Rectal bleeding | 2.4 | 1.45–3.98 | 0.001 |
| Altered bowel habit | 1.78 | 1.08–2.93 | 0.024 |
| Unexplained weight loss | 3.25 | 1.60–6.62 | 0.001 |
| Iron deficiency anemia | 2.72 | 1.43–5.18 | 0.002 |
| Positive fecal occult blood test | 2.89 | 1.26–6.62 | 0.012 |
| Family history of colorectal cancer | 2.05 | 0.93–4.50 | 0.074 |
| Smoking history | 1.63 | 0.96–2.78 | 0.07 |

**Table 5.** Multivariate Logistic Regression Analysis of Predictors of Significant Colorectal Lesions

## Discussion

This study found significant colorectal lesions in 105 (30.0%) of 350 adult patients undergoing colonoscopy. The overall yield was clinically meaningful, with colorectal polyps detected in 82 patients (23.4%), colorectal mass or suspected carcinoma in 27 (7.7%), and inflammatory bowel disease in 25 (7.1%). This pattern supports the continuing value of colonoscopy in symptomatic adult patients, especially where organized colorectal cancer screening is limited. The 30.0% significant lesion rate is higher than the 12.5% polyp detection reported by Stratmann et al. among symptomatic patients younger than 55 years, but closer to their 26.6% polyp rate among symptomatic patients aged ≥55 years [14]. It is also comparable to the 28.1% colorectal polyp rate reported by Khamees et al. in Jordan [15]. Norouzi et al. similarly reported a high burden of colorectal polyps among symptomatic colonoscopy candidates, with tubular adenoma accounting for 43.2% of detected polyps and malignancy in 13.2% of lesions [16].

The carcinoma or suspected carcinoma rate in our study was 7.7%, which was higher than the 0.4% colorectal cancer rate reported by Stratmann et al. in symptomatic patients under 55 years and higher than the 18.65 per 1000 patients reported by Khamees et al. [14,17]. This may reflect our hospital-based symptomatic population, inclusion of older adults, delayed health-seeking behavior, and possible referral bias. Global evidence also supports the increasing burden of colorectal cancer, with Xi and Xu reporting more than 1.9 million new cases and over 930,000 deaths globally in 2020 [18]. The GBD 2019 analysis also showed substantial regional variation and a rising burden, particularly in settings undergoing dietary and lifestyle transition [19].

The most common lesion sites in this study were the sigmoid colon (29.8%) and the rectum (26.0%), indicating a predominance of distal colorectal pathology. This is consistent with the clinical pattern of rectal bleeding and altered bowel habit, but differs from Khamees et al., who reported the right colon as the most common polyp site (51.0%), followed by the sigmoid colon (24.8%) [15]. The difference may reflect variation in population characteristics, screening versus diagnostic colonoscopy, bowel preparation quality, and histopathological case mix. The relatively high distal lesion burden suggests that rectosigmoid evaluation is important, while proximal lesions in other studies reinforce the need for full colonoscopy when significant pathology is suspected.

In the present study, significant lesions were more frequent among patients aged >50 years, 64.8% versus 35.9%, p<0.001, and age >50 years remained an independent predictor (AOR 2.35). This agrees with Matyja et al., who found adenoma detection increased with age, with ADR rising from 27.82% at 50–55 years to 33.43% at 61–65 years [20]. Yousaf et al. also emphasized adenoma detection rate as an important quality indicator in colonoscopy practice [21]. Male sex was another independent predictor in our study (AOR 1.85), consistent with Matyja et al., who found higher ADR in males than females (38.80% versus 25.95%) [20]. Zhang et al. similarly reported male sex as a strong predictor of colorectal polyps (OR 3.810) [22].

Among clinical features, unexplained weight loss was the strongest predictor (AOR 3.25), followed by a positive fecal occult blood test (AOR 2.89), iron-deficiency anemia (AOR 2.72), and rectal bleeding (AOR 2.40). These findings agree with Demb et al., whose meta-analysis showed hematochezia in 45%, abdominal pain in 40%, and altered bowel habit in 27% of early-onset colorectal cancer patients, with hematochezia increasing the risk at least fivefold [10]. Fritz et al. also identified abdominal pain, rectal bleeding, diarrhea, and iron deficiency anemia as red-flag symptoms, with odds ratios ranging from 1.34 to 5.13 [23]. Withrow et al. found that FIT at 10 µg Hb/g had 92.1% sensitivity and 91.5% specificity for colorectal cancer in symptomatic primary-care patients, supporting the predictive value of fecal blood testing [24]. Hampton et al. showed that FIT-based models can improve risk stratification for symptomatic patients [12]. The COLOFIT Research Group further showed that combining FIT with age, sex, and blood indices can improve risk stratification for symptomatic patients [25].

The findings also indicate that symptoms alone should not be interpreted in isolation. Ismail et al. reported that lower gastrointestinal symptoms and symptom-based triage systems were poor predictors of clinically significant disease [26]. O'Morain et al. similarly reported low symptom-specific PPVs for colorectal cancer, such as 1.2% for rectal bleeding, 2.3% for altered bowel habit, and 2.5% for weight loss, although the symptomatic group still had an adenoma detection rate of 26.3% [27]. Therefore, the main takeaway from our study is that adults with alarm features, particularly age >50 years, rectal bleeding, altered bowel habit, weight loss, iron deficiency anemia, and positive fecal occult blood test, should be prioritized for colonoscopy.

**Limitations of the study:** This single-center cross-sectional study may have limited generalizability. Selection bias was possible because only patients undergoing colonoscopy were included. Some data depended on patient history and medical records. Histopathology was not available for all findings, and long-term follow-up was not performed.

## Conclusion

This study concluded that significant colorectal lesions were detected in a considerable proportion of adult patients undergoing colonoscopy. Colorectal polyps were the most common finding, while colorectal carcinoma and inflammatory bowel disease also contributed notably to the disease burden. Age above 50 years, male sex, rectal bleeding, altered bowel habit, unexplained weight loss, iron deficiency anemia, and positive fecal occult blood test were important independent predictors of significant colorectal lesions. These findings highlight the need for early colonoscopy in patients with alarm symptoms and support a risk-based approach to prioritizing colonoscopy in resource-limited settings.

## Recommendations

Early colonoscopy should be prioritized for high-risk adults, particularly those aged above 50 years, males, and patients with rectal bleeding, altered bowel habit, weight loss, iron deficiency anemia, or positive fecal occult blood test. Larger multicenter studies with histopathological follow-up are recommended.

**Funding:** No funding sources

**Conflict of interest:** None declared

**Ethical approval:** The study was approved by the Institutional Ethics Committee.

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