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WORD COUNT

4272

TIME SUBMITTED

31-OCT-2025 10:29AM

PAPER ID

118832143

**Name of Journal:** *World Journal of Gastrointestinal Surgery*

**Manuscript NO:** 113040

**Manuscript Type:** ORIGINAL ARTICLE

*Retrospective Cohort Study*

**Perioperative characteristics and outcomes of colorectal cancer in elderly patients**

Sultan A *et al.* Perioperative characteristics and outcomes of colorectal cancer in elderly patients

### **Abstract**

#### **BACKGROUND**

Colorectal cancer (CRC) in older populations presents unique management challenges due to age-related physiological changes and comorbidities, yet this demographic is often underrepresented in clinical research.

#### **AIM**

To characterise the perioperative features and outcomes of older CRC patients undergoing surgery at a tertiary hospital in Malaysia.

#### **METHODS**

A cross-sectional study was conducted using patient records of older individuals ( $\geq 65$  years) diagnosed with CRC and who underwent surgery at Hospital USM, Malaysia, between January 2017 and December 2021. Data on patient characteristics, operative details, pathological findings, BMI based on the Asian classification and postoperative outcomes were collected. Statistical analysis employed  $\chi^2$  and t-tests to determine associations and identify significant predictors.

#### **RESULTS**

The study included 98 participants (57.1% males, 82.7% Malay), with the majority aged 65-69 years (44.9%). BMI showed a significant association with age groups ( $P = 0.023$ ), with obesity prevalent in 70-74 and 75-79-year-olds. The type of operation ( $P = 0.046$ ) and PN stage ( $P = 0.027$ ) were significantly associated with age groups. Adjuvant treatment demonstrated a significant association with recurrence and follow-up ( $P = 0.006$ ). Multivariate analysis revealed that BMI, ischaemic heart disease, and M stage were statistically significant predictors of patient survival after follow-up. Overweight patients were 11.22 times more likely to survive than underweight (AOR = 11.22,  $P = 0.016$ ), while those with ischaemic heart disease (AOR = 0.07,  $P = 0.027$ ) or M1 stage (AOR = 0.24,  $P = 0.014$ ) had significantly lower survival odds.

## CONCLUSION

BMI, ischaemic heart disease, and metastatic status are critical determinants of survival, highlighting the importance of comprehensive preoperative assessment and tailored management strategies for this vulnerable population. Further larger-scale, longitudinal studies are needed to improve outcomes for older adults with CRC.

**Key Words:** Colorectal cancer; Elderly; Perioperative features; Outcomes; Surgery

Sultan A, Zakaria Z, Riaz S, Goni MD, Zakaria AD. Perioperative characteristics and outcomes of colorectal cancer in elderly patients. *World J Gastrointest Surg* 2025; In press

**Core Tip:** This study assessed perioperative outcomes and prognostic factors in 98 older CRC patients ( $\geq 65$  years) undergoing surgery at a Malaysian tertiary hospital. BMI, ischaemic heart disease, and metastatic status (M stage) were identified as significant predictors of survival. Overweight patients showed better survival, while those with ischaemic heart disease or metastasis had poorer outcomes. Our study provides valuable regional insights into perioperative characteristics and prognostic factors in older CRC patients. These findings highlight the importance of comprehensive

preoperative assessment and tailored management strategies, as well as the need for larger-scale, longitudinal studies to optimise care and improve outcomes in this vulnerable population.

## **INTRODUCTION**

Colorectal cancer (CRC) is defined by unregulated cell growth originating in the colon, encompassing the ascending, transverse, descending, and sigmoid colon, as well as the rectum[1]. The most common clinical manifestation of CRC is haematochezia, especially in patients with recto-sigmoidal region cancer. Patients commonly present with altered bowel habits, rectal bleeding, and abdominal discomfort. Other signs and symptoms encompass fever, anaemia, weight loss, and abdominal mass[2].

CRC is classified as a "lifestyle or behavioural" disease, linked to factors including unhealthy dietary practices rich in calories and animal fat, alcohol intake, smoking, *Helicobacter pylori* infection, obesity, and physical inactivity[3,4]. The pathogenesis of CRC is multifactorial. The epithelial cells of the colorectal mucosa might develop hyperplasia, atypical hyperplasia (mild, moderate, severe), and adenomas, which can eventually progress to carcinoma[5].

<sup>1</sup> CRC ranks as the third most common disease globally and is the second leading cause of cancer-related mortality, with 916,000 fatalities recorded in 2020[6,7]. The incidence of CRC differs across geographical regions, being most common in North America, Western Europe, and Oceania, while exhibiting lower prevalence rates in Africa, Asia, and South America[8]. Compared to other Asian countries such as Japan, South Korea, and Singapore, the incidence rate of CRC is lower in Malaysia[9]. There currently is a noticeable upward trend in the incidence and mortality of colorectal cancer observed in Asian countries, including Malaysia[10]. This trend may be ascribed to colorectal cancer screening initiatives, diminished prevalence of risk factors, and/or enhanced treatments in these nations.

In Malaysia, CRC is the second most prevalent cancer, accounting for 13.5% of all newly diagnosed cancer cases from 2012 to 2016[11]. Lim *et al.* (2020) reported that more <sup>2</sup>

than half of the CRC patients recorded rectal tumours (51.8%) compared to colonic tumours (43.3%)[12]. The risk of CRC increases with age, with over 80% of CRC cases in Malaysia being diagnosed in individuals over the age of 50. The age-standardized incidence rate (ASR) for men was found to be 14.8 per 100,000, compared to 11.1 per 100,000 for women. However, several other studies reported no significance difference between men and women in Malaysia[13]. The incidence of CRC was found to be different between different ethnic groups, being highest in the Chinese, compared to the Malay and Indian populations[11].

The prognosis for CRC is significantly influenced by the disease <sup>6</sup>stage at diagnosis, with 5-year survival rates of 90% and 80% for Stages 1 and 2, 30–60% for Stage 3, and approximately 5–10% for Stage 4[14]. Malaysia, classified as a higher-middle-income nation, exhibited an overall 5-year survival rate of 46.5% during the period from 1997 to 2000[12]. The five-year survival rate for CRC patients in Malaysia ranges from 34% to 60%. A specific cohort <sup>2</sup>in Kuala Lumpur recorded a 5-year survival rate of 60.5%, whereas a study from Kelantan indicated a 5-year survival rate of 34.3%[15,16]. The variations are likely attributable to differences in the demographic and clinical profiles of colorectal cancer patients at diagnosis, as well as disparities in access to early diagnostic procedures and treatment across different clinical settings.

A large percentage of CRC cases in Malaysia are reported in the late stage in elderly population, resulting in a poor prognosis, which significantly elevates the healthcare burden due to increased treatment costs and diminished quality of life in later stages[16]. Currently, Malaysia with its multiethnic population, lacks a formalized national colorectal cancer screening program. The enhancement of socioeconomic status and the adoption of a more westernized lifestyle in developing Asian countries, such as Malaysia, may correlate with a rising incidence of CRC. It is experiencing population aging, accompanied by rising affluence and a heightened prevalence of CRC risk factors, including a westernized diet, obesity, and smoking[17].

Surgical resection currently offers the most promising chance of cure for patients with CRC[18]. The proportion of elderly patients requiring surgery for CRC is increasing[19].

<sup>1</sup> Treatment of elderly CRC patients remains difficult due to comorbidities, frailty, malnutrition, and impaired cognitive and functional status, despite advancements in surgical techniques and perioperative care[20]. <sup>1</sup> Such complex patients are at higher risk for various postoperative complications after major surgery, including a higher risk for infectious complications and anastomotic leakage (AL). Furthermore, elderly patients are at higher risk for death in case of postoperative complications because of the impaired functional reserve. These risks usually impact the surgeon's decision on the surgical plan, especially for elderly patients with left sided CRC where Hartmann's procedure may be selected instead of primary anastomosis[21].

Additionally, there is a lack of research that predicted the relationship between the overall survival rate of colorectal cancer patients within developing regions of Malaysia and its demographic and clinical characteristics. Despite numerous studies recording survival outcomes for CRC patients in various tertiary hospitals in Malaysia[22], there have been <sup>2</sup> no local studies into perioperative colorectal cancer survival outcomes from Kelantan, a developing state in Malaysia, in the past decade. It is important to establish the correlation between perioperative characteristics and treatment outcomes on the overall survival rate to enhance cancer treatment and facilitate early detection.

As a result, we conducted this <sup>2</sup> study to determine the 5-year overall survival rate of colorectal cancer patients who were treated at Hospital Universiti Sains Malaysia (HUSM), a tertiary hospital in Kelantan, Malaysia, during January 2017 to December 2021. Furthermore, we evaluated the characteristics of CRC as well as impact of clinical and treatment factors among elderly patients.

## **MATERIALS AND METHODS**

### ***Study design and patients***

This is a cross-sectional study design using secondary data and Strobe guidelines conducted between January 2017 and December 2021. Retrospective Chart Review (RCR) is a method used to retrieve data from patients' medical records to address the research question. The study included all the patients who were examined for colorectal

cancer and had undergone surgery at Hospital Universiti Sains Malaysia (HUSM), Kelantan, Malaysia.

#### *Patient recruitment*

Patient selection was based on specific inclusion and exclusion criteria. Included were medical records of male and female patients aged 65 years and above who underwent elective or emergency surgery, with pathologically confirmed primary adenocarcinoma located from the appendix to the rectum. Both laparoscopic and open surgical techniques were considered, along with patients who received neoadjuvant or adjuvant chemotherapy. Records of patients with recurrent cancer, metastases from other cancers, or those who underwent diversion without resection, as well as patients who did not undergo surgery or received palliative surgery, were also included. Patients under 65 years of age and cases with missing data were excluded.

Data collection was extracted from the patient Folders record and Operation record for all the patients fulfilling the inclusion and exclusion criteria in the last 5 years.

#### <sup>4</sup> *Statistical analysis*

The data was entered into Microsoft excel. The Statistical Package for Social Science (SPSS) version 27 was used for all statistical analysis. Descriptive statistics was used for data tabulation. Categorical variables such as gender, BMI and age group were described by frequency (n) and percentage (%) and compared *via* the use of the  $\chi^2$  test. The numerical <sup>3</sup> variables were presented as mean (Standard Deviation) and compared using the Student t-test. A p-value < 0.05 was considered significant.

## **RESULTS**

### *Patient demographics and baseline characteristics*

The study cohort comprised 98 elderly colorectal cancer patients, with a slight male predominance as 56 (57.1%) were male and 42 (42.9%) were female (Figure 1). Ethnically, the sample was largely Malay, accounting for 81 (82.7%) of participants,

followed by Chinese with 16 (16.3%), and one participant from other ethnic groups (1.0%) (Figure 2). The majority of patients were in the 65-69 years age bracket ( $n = 44$ , 44.9%), followed by 28 (28.6%) aged 70-74 years (Figure 3). Body Mass Index (BMI) analysis indicated that most patients had a normal BMI ( $n = 61$ , 62.2%), while 25 (25.5%) were classified as overweight (Figure 4).

When examining the association between patient characteristics and age groups, BMI was the sole characteristic demonstrating a statistically significant association ( $P = 0.023$ ) (Table 1). The prevalence of obesity was notably highest among those aged 70-74 years and 75-79 years, each accounting for 33.3% of obese individuals within their respective age brackets. Gender distribution, which showed 40.5% of females and 48.2% of males in the 65-69 age group, did not significantly differ across age groups ( $P = 0.382$ ), suggesting a consistent male predominance throughout the elderly cohort. Similarly, ethnicity did not exhibit a significant association with age groups ( $P = 0.724$ ), with the overall ethnic composition remaining stable across different elderly age ranges. Preoperative carcinoembryonic antigen (CEA) levels (*e.g.*,  $73.89 \pm 174.25$  for 65-69 years) also showed no significant association with age ( $P = 0.603$ ), indicating comparable baseline tumour marker levels across elderly age categories. The presence of chronic kidney disease (CKD) did not significantly vary by age group ( $P = 0.632$ ), implying that this comorbidity was not disproportionately higher in older elderly patients. Likewise, hypertension ( $P = 0.598$ ), hyperlipidemia ( $P = 0.490$ ), and ischemic heart disease ( $P = 0.753$ ) showed no significant association with age groups, suggesting these comorbidities were relatively evenly distributed across the elderly spectrum in this cohort. ASA classification, an assessment of operative risk, did not significantly vary across age groups ( $P = 0.186$ ), indicating a generally consistent physiological status for surgery regardless of the specific elderly age subgroup. Tumour location ( $P = 0.605$ ) and the type of pre-operative adjuvant treatment ( $P = 0.418$ ) also did not have a significant association with age groups, meaning the anatomical distribution of CRC and the use of pre-operative therapies were not influenced by the patient's age within the elderly cohort.

### ***Pathology and operative data***

Analysis of the relationship between participants' pathology and age groups revealed significant associations with both the type of operation ( $P = 0.046$ ) and PN stage ( $P = 0.027$ ) (Table 2). Open surgeries were more commonly performed in the younger elderly (65-69 years: 46.2%) but also notably prevalent in the very old (80-84 years: 12.8%; 85-89 years: 7.7%), while laparoscopic procedures were more prevalent among those aged 70-74 (35.6%) and 75-79 (16.9%), suggesting varied surgical approaches across different elderly age categories. Regarding lymph node involvement, the N2 stage was most common among participants aged 65-69 (48.1%), whereas the N1 stage was more frequently observed in those aged 70-74 (42.3%) and 80-84 (11.5%), and the N0 stage was most common in the 75-79 (28.9%) and 85-89 (6.7%) age groups, indicating potential differences in nodal burden distribution across elderly age cohorts. In this study, lymph node status (N0, N1, N2) was classified according to the AJCC 8th edition TNM system based on the number of metastatic lymph nodes identified on postoperative histopathology. The M stage was primarily determined using preoperative imaging (CT scan) and, where available, confirmed by postoperative histopathology, ensuring consistency with standard staging practices. Preoperative characteristics ( $P = 0.558$ ) and the overall treatment type ( $P = 0.756$ ) did not significantly vary by age group, indicating consistent approaches to initial management regardless of age. Furthermore, PT stage ( $P = 0.544$ ), M stage ( $P = 0.357$ ), overall cancer stage ( $P = 0.431$ ), and tumour size ( $P = 0.341$ ) showed no significant association with age groups, implying that the extent of disease at presentation, including distant metastasis and tumor burden, was comparable across different elderly age ranges.

### ***Postoperative characteristics***

Examination of postoperative characteristics and their association with age groups revealed that adjuvant treatment was significantly associated with age groups ( $P = 0.006$ ) (Table 3). Among patients receiving adjuvant treatment, 52.2% were in the 65-69

age group, compared to 29.0% of those not receiving adjuvant treatment in the same age group, suggesting that younger elderly patients are more likely to undergo adjuvant therapy, which may reflect considerations of treatment tolerance and anticipated benefit. For other postoperative characteristics, there was no significant association with age groups. The time to pass gas ( $P = 0.068$ ) and stool ( $P = 0.194$ ) did not significantly vary across age groups, suggesting similar patterns of bowel function recovery regardless of age within the elderly cohort. The time to initiation of oral feeding ( $P = 0.217$ ) also showed no significant association with age groups, indicating a comparable speed of nutritional recovery across the elderly. Postoperative hospital stays ( $P = 0.828$ ), measured as means (e.g.,  $9.75 \pm 11.26$  days for 65-69 years), was not significantly associated with age, implying similar durations of hospitalization across different elderly age groups. Postoperative complications, classified by Clavien-Dindo grades, did not significantly vary by age group ( $P = 0.775$ ). While a higher prevalence of Grade 4b complications was observed in 65-69-year-olds (100%) and Grade 3a in 70-74-year-olds (100%), these specific observations were not statistically significant when considering the overall distribution of all complication grades across all age groups. Reoperation rates ( $P = 0.535$ ), recurrence rates ( $P = 0.358$ ), and follow-up status ( $P = 0.316$ ) also did not show a significant association with age groups, suggesting consistent needs for repeat surgeries, risk of cancer recurrence, and successful follow-up rates across the elderly cohort.

#### ***Factors associated with survival after follow-up***

Analysis of factors associated with survival after follow-up identified BMI, ischemic heart disease, and M stage as statistically significant predictors (Table 3). For BMI, overweight individuals were found to be 11.22<sup>8</sup> times more likely to survive compared to underweight patients (AOR = 11.22, 95%CI: 1.57, 80.31;  $P = 0.016$ ). This highlights the critical importance of adequate nutritional status for survival in elderly CRC patients, as being underweight presents a significant survival disadvantage. The presence of ischemic heart disease (IHD) significantly reduced survival, with affected individuals

being 93% less likely to survive <sup>1</sup> compared to those without IHD (AOR = 0.07, 95%CI: 0.01, 0.74;  $P = 0.027$ ). This underscores IHD as a significant comorbidity negatively impacting long-term outcomes in this elderly cohort. Furthermore, M stage (distant metastasis) was a strong predictor of survival, with patients having M1 stage being 76% less likely to survive compared to those with M0 stage (AOR = 0.24, 95%CI: 0.08, 0.75;  $P = 0.014$ ). This finding is consistent with established oncology principles, where distant metastatic disease is a major determinant of prognosis.

## <sup>7</sup> DISCUSSION

CRC represents a significant global health burden, with its incidence steadily rising, particularly within older populations[23]. As life expectancy increases, a growing number of older adults are diagnosed with CRC, presenting unique challenges in their management due to age-related physiological changes, increased comorbidities, and potential functional limitations[24]. Despite this, older patients have historically been underrepresented in clinical trials, leading to a paucity of specific evidence-based guidelines for their treatment. Our study aimed to characterise the perioperative features and outcomes of older CRC patients undergoing surgery at a tertiary hospital in Malaysia, thereby contributing valuable regional data to better understand this vulnerable patient group and optimise their care. Critically, our findings reveal that BMI, ischaemic heart disease, and M stage are statistically significant predictors of patient survival, with adjuvant treatment also showing a significant association with recurrence and follow-up. Elderly CRC patients frequently present with comorbidities such as hypertension, diabetes mellitus, ischemic heart disease, and chronic kidney disease, alongside functional limitations including frailty, impaired mobility, malnutrition, and sarcopenia, all of which complicate surgical decision-making and postoperative recovery. By examining patient characteristics, operative data, and postoperative outcomes, including survival, this research provides insights into local epidemiology and factors influencing prognosis, ultimately informing improved risk stratification and personalised treatment strategies to address existing literature gaps.

Our study observed a significant proportion of older patients, with the majority falling within the 65-69 years (44.9%) and 70-74 years (28.6%) age groups. This aligns with global trends illustrating an increasing incidence of CRC in older populations, where over half of new CRC diagnoses in the United States occur in individuals over 65 years[25]. Regarding gender, our findings indicate a male predominance (57.1% males vs. 42.9% females). A recent study evaluating the global incidence rates of CRC by Darmadi *et al.* (2025) revealed similar findings[26]. Out of 1,931,590 CRC cases globally, 55.5% were predominance in males; other studies, particularly in Asian contexts, also report a higher incidence in males, which is consistent with our results[27]. Moreover, mortality rates among men are higher compared to females. Conversely, some studies have reported a higher increase in CRC incidence than in men in ages 50-74 among octogenarian CRC patients[28,29]. Although incidence and crude mortality rates were higher among men and Chinese patients, our analysis found no significant differences in survival or cure rates by gender or ethnicity, indicating that while disease burden varies across demographic groups, treatment outcomes in terms of survival remain independent of these factors. Our findings further illustrate that adjuvant therapy was significantly associated with a reduced risk of recurrence, supporting existing evidence that adjuvant chemotherapy can improve outcomes even in elderly CRC patients.

A key strength of our study is its focus on a predominantly Malay (82.7%) and Chinese (16.3%) population. This provides crucial data from Southeast Asia, a region less frequently highlighted in broader cross-sectional studies which often focus on Western populations, such as those utilising the National Health and Nutrition Examination Survey (NHANES) data from the US. This regional focus helps to contextualise the unique epidemiological patterns and treatment responses in different ethnic groups. Previous retrospective study from Malaysia reported contrasting results that Chinese ethnicity had highest CRC incidence followed by Malays[30]. While another recent study from Malaysia reported near equal distribution of incidence between Chinese (47%) and Malay (41.3) populations[11]. These difference in findings

could be attributed to the regional demographics. Thus, necessitating further studies using large cohorts.

In this study, most participants had a normal BMI (62.2%), but observed the highest prevalence of obesity in the 70-74 and 75-79 age groups (33.3% each), with a significant association between BMI and age groups ( $P = 0.023$ ). This supports the general understanding of obesity as a CRC risk factor[31]. However, contrasting findings exist; some research indicates that obese BMI is associated with early-onset CRC (18-49 years) but not necessarily with older adult CRC ( $\geq 50$  years)[32]. A study by Liu *et al.* (2018), presented that obesity nearly doubled the risk of early-onset of CRC among women[33]. Additionally, studies exploring other adiposity measures like Relative Fat Mass (RFM) or A Body Shape Index (ABSI) suggest complex, age-modified relationships with CRC prevalence[34]. RFM is reported to strongly associated with CRC prevalence among elderly. However, another study reported that underweight CRC patients had worse survival than non-underweight patients[35]. These varying findings underscore the need for further research into the nuanced effects of BMI and body composition on CRC in different age and ethnic groups. In our cohort, recurrence was significantly associated with both adjuvant therapy and follow-up status, underscoring the importance of sustained surveillance and treatment adherence in reducing the likelihood of cancer recurrence.

In addition, this study identified M stage (metastatic status) as a significant predictor of survival. This is consistent with established prognostic factors for CRC, which include the degree of tumour penetration, nodal involvement, and the presence of distant metastases[36]. A study from Sabah, Malaysia, demonstrated that patients diagnosed with stage IV CRC (M1 stage) had an 11-fold increased risk of mortality compared to those diagnosed at stage I, underscoring the significant impact of metastatic status on survival[37]. While our study does not explicitly detail Lymph Node Yield (LNY), the importance of M stage indirectly highlights the role of lymph node assessment. Other studies have observed a decline in LNY with advancing age[38]. Although a minimum of 12 Lymph nodes is generally recommended for

accurate staging in colorectal cancer, this benchmark is often not achieved, particularly in older patients, potentially due to physiological lymph node degeneration or less extensive surgical resections. Nonetheless, a higher LNY is consistently associated with improved survival outcomes [39]. Recent study by Liu *et al.* (2025) suggests that a higher LNY (*e.g.*, minimum 18) may be linked to improved survival in older patients with right-sided colon cancer[39].

Furthermore, our finding that ischaemic heart disease significantly predicts patient survival is in line with previous literature. Patients with pre-existing cardiovascular diseases (CVD) including ischaemic heart disease are reported to have poorer outcomes than those without CVD[40]. Elder CRC patients often present with multiple comorbidities, which significantly increase the risk of postoperative complications, morbidity, and mortality. Studies have specifically linked sarcopenia combined with nutritional disorders and open surgical approaches to increased short-term postoperative complications in older patients with CRC[41].

Furthermore, this study found a significant association between adjuvant treatment and recurrence, as well as follow-up. These findings were in accordance to a previous study by Zare-Bandamiri *et al.* (2017) adjuvant therapy had a significant association with cancer recurrence[42]. This supports the evidence that adjuvant chemotherapy can benefit older patients with Stage III colon cancer, with its effectiveness being independent of age and comorbidity[43]. However, a persistent challenge is that older patients are often less likely to receive standard adjuvant therapy due to concerns about treatment toxicity, existing comorbidities, and overall quality of life. This discrepancy between potential benefit and actual treatment receipt highlights a crucial area for improved clinical guidelines and patient management in geriatric oncology.

The limitations of this study include Firstly, as a <sup>5</sup> cross-sectional study, it captures data at a single point in time, which inherently limits our ability to establish causal relationships between observed characteristics and outcomes. Furthermore, the relatively low sample size of 98 participants, while providing initial insights, restricts the generalisability of our findings to the broader older CRC population in Malaysia or

other regions. A larger cohort would enable more robust statistical analysis, the detection of subtler associations, and potentially more precise risk stratification. Future research employing longitudinal designs and larger, multi-centre cohorts would therefore offer a more comprehensive and robust understanding of perioperative characteristics and long-term outcomes in this important patient group.

### **CONCLUSION**

In summary, our study on older colorectal cancer patients in a Malaysian tertiary hospital revealed a male predominance within a predominantly Malay and Chinese cohort. While most patients presented with a normal BMI, obesity was significantly associated with specific older age groups. Surgically, the type of operation and lymph node involvement were significantly associated with age, while adjuvant treatment was found to be significantly linked to recurrence and follow-up. Crucially, our findings highlight that BMI, ischaemic heart disease, and the presence of distant metastases (M stage) are statistically significant predictors of patient survival. These insights are vital for tailoring perioperative management and prognostic assessment in older CRC patients in this region, contributing to a more nuanced understanding of this vulnerable population.

Furthermore, investigating the reasons behind differential adjuvant treatment uptake in older age groups is also crucial to ensure equitable access to potentially beneficial therapies, whilst also examining the effectiveness and toxicity of these treatments in real-world older patient populations. Finally, comparative studies with other Asian and Western cohorts, utilising standardised data collection methods, would contribute to a more comprehensive global understanding of CRC management in older adults.

### **ACKNOWLEDGEMENTS**

The authors would like to express gratitude to Associate Professor Maya Mazuwin Yahya, Head of the Department of Surgery, and all faculty members for their assistance and contributions to this study.

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