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Review Article

Post-operative complications following colorectal cancer surgery in Nigeria and Ghana: A systematic review

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Abstract

Colorectal cancer is the third most common cancer worldwide. There is a rising incidence of colorectal cancer in low- and middle-income countries, including Nigeria and Ghana. Surgical treatment for colorectal cancer has demonstrated efficacy, albeit with a higher incidence of postoperative complications in low- and middle-income countries. This review aimed to explore the complications following surgery for colorectal cancer, in Nigeria and Ghana. This review was guided by the Cochrane Handbook for Systematic Reviews of Interventions and the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guideline. We searched Science Direct, MEDLINE, Embase, CINAHL, Scopus, and APA PsycINFO databases. All searches were conducted in August 2024. All study designs reporting surgical treatment of colorectal cancer within the past 10 years in Nigeria and Ghana were included. Four authors extracted the data, and a fifth author reviewed the data for accuracy and completeness. The Joanna Briggs Institute critical appraisal tools for cross-sectional, case series, and case-control studies were used for data quality assessment. A total of eleven studies with 6971 patients were included in this review. Males accounted for 57.1% of the patients and 42.9% were females. Study designs were mostly cross-sectional with sample sizes ranging from 2 to 4898. About half (50.7%) of the surgeries performed for colorectal cancer were hemicolectomies. A total of 530 postoperative complications were reported with the most reported as surgical site infection 27.5%. Other postoperative complications were death (21.7%), fascial/wound dehiscence (12.6%), bowel obstruction (11.1%), fistulae (10.6%), anastomotic leak (6.4%), bleeding (1.5%) and others (8.3%). There is a significant burden of postoperative complications following colorectal cancer surgery. The findings from this review suggest that there are key challenges with surgical treatment for colorectal cancer in the West African region that need to be addressed to improve the postoperative outcomes of patients.

Keywords: Colorectal, cancer, surgery, complications, Ghana, Nigeria

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Quick Response Code:

Introduction

Cancer is one of the leading causes of morbidity and mortality globally.[1] In Africa, cancer is an emerging crisis, and it is becoming a priority for healthcare systems in West Africa.[1,2] Seventy percent of the 24 million people predicted to have cancer by 2050 will be in low- and middle-income countries (LMIC).[1]

Accounting for approximately 10% of all cancer cases, colorectal cancer is the third most common cancer worldwide. It is also the second leading cause of cancer-related deaths worldwide.[3] As of 2020, more than 1.9 million new cases and more than 930,000 deaths due to colorectal cancer were estimated to have occurred worldwide.[4] By 2040, this burden will increase to 3.2 million new cases representing a 63% rise, and 1.6 million deaths per year representing an increase of 73%.[5]

Traditionally, colorectal cancer was considered a disease of Western countries; however, recent data suggest a growing burden in low- and middle-income countries (LMICs), including Nigeria and Ghana.[6] The rising incidence in these countries is likely due to a combination of factors, including changes in diet, lifestyle, and increased life expectancy which were previously characteristic of Western civilizations but are also becoming common in LMICs.

There is a high burden of cancer mortality in LMICs compared to high-income countries. The factors contributing to this burden range from late disease presentation to poor access to diagnosis and treatment.[7] Surgical intervention has proven effective in the removal and treatment of colorectal cancer. However, several postoperative complications have been reported, significantly contributing to morbidities, extended hospitalisation, and mortality.[8] Complications arising from colorectal surgeries can be classified into two categories: intra-operative and postoperative complications. Some common postoperative complications include wound infection, anastomotic leaks, ileus, and bleeding, with surgical site infections (SSI) being the most frequently occurring complication.[9] These postoperative complications are reported to be disproportionately high in LMICs.[7]

This review sets out to explore the complications following surgery for colorectal cancer, in Nigeria and Ghana.

Materials and Methods

This review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guideline.[10] Relevant sections were delineated using the PRISMA Checklist and the PRISMA flow diagram was used to depict the search process used in the selection of articles for this review.

Search strategy and data sources.

A search of ScienceDirect, MEDLINE, Embase, CINAHL, Scopus, and APA PsycINFO databases was carried out in August 2024. The search terms included “Nigeria” “Ghana”, “colorectal cancer”, “colorectal tumour”, “rectum tumour” “postoperative complication”, “morbidity” and mortality” combined with Boolean operators ‘AND’ and ‘OR’. Wildcards and truncation were also used to broaden the search. Reference and citation searches were carried out to further identify potential articles for inclusion. The literature search strategy is shown below.

Population: Nigeria, Ghana

1. 'nigeria'
2. 'nigerian'
3. 'ghana'
4. 'ghanaian'

Issue of Interest: Colorectal cancer

5. 'colorectal cancer'
6. 'colorectal tumour'
7. 'colon cancer'
8. 'colon tumour'
9. 'rectum cancer'
10. 'rectum tumour'

Outcome: Postoperative complications of surgery

11. 'postoperative complication'
12. 'Surgical complication'
13. 'anastomosis leak*'
14. 'infection'
15. 'bleeding'
16. 'ileus'
17. 'intestinal obstruction'
18. 'bowel obstruction'
19. 'fistula'
20. 'intestine perforation'
21. 'abscess'
22. 'fascial dehiscence'
23. 'survival'
24. 'death'
25. 'morbidity'
26. 'mortality'
27. 'outcome'
28. 1 OR 2 OR 3 OR 4
29. 5 OR 6 OR 7 OR 8 0R 9 0R 10
30. 11 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17 OR 18 OR 19 OR 20 OR 21 OR 22 OR 23 OR 24 OR 25 OR 26 OR 27
31. 28 AND 29 AND 30

Sample search query

('nigeria OR 'nigerian' OR 'ghana' OR 'ghanaian') AND ('colorectal cancer' OR 'colorectal tumour' OR 'colon cancer' OR 'colon tumour' OR 'rectum cancer' OR 'rectum tumour') AND ('postperative complication' OR 'Surgical complication' OR 'anastomosis leak*' OR 'infection' OR 'bleeding' OR 'ileus' OR 'obstruction' OR 'fistula' OR 'intestine perforation' OR 'abscess' OR 'fascial dehiscence' OR 'survival' OR 'death' OR 'morbidity' OR 'mortality' OR 'outcome')

Study eligibility (Inclusion and exclusion criteria)

All published literature within 10 years on the surgical treatment of CRC in Nigeria and Ghana was considered. Titles and abstracts of identified publications were screened. We were guided by the PICO method to define our inclusion criteria.[11] Studies conducted on patients who had undergone surgical treatment for CRC, and reported data on postoperative complications of CRC surgeries were included. Studies of more than one cancer site were included only if the surgery/outcomes for CRC were presented separately from those of the other cancer site. Owing to a dearth of publications on postoperative complications of surgical treatment for CRC, all study designs were included.

Data Extraction

Data screening and selection was carried out using the Mendeley reference manager. Articles were manually screened by two authors (TOT, FIO) independently. Conflicts were resolved by discussion and consensus. Data was extracted on study characteristics, type of surgical resection, and post-operative complications. Extracted data were presented in tables.

Data synthesis

The characteristics of the studies were summarised using descriptive statistics; frequencies and percentages were used to summarise findings. A narrative synthesis of findings was done.

Plan for Risk of Bias (RoB) Assessment

The Joanna Briggs Institute (JBI) critical appraisal tools for cohort, cross-sectional studies, case control and cohort series studies were used to assess RoB in this review.[10] Each study was assessed as low, moderate, or high risk of bias, by two independent reviewers, providing some rigour to the assessment.

Results

Study selection

The search terms were fed into six databases- Medline, Scopus, Embase, APA PsycINFO, ScienceDirect, and CINAHL. A total of 2200 articles were identified with the first hit (Table 1). Automation tools marked 1599 results as ineligible based on eligibility criteria. Six hundred and one articles were screen, 9 were sought for retrieval, and 2 full articles were unavailable. Seven full articles were reviewed and included. Four additional references were retrieved following the stringing of references and citations of the included articles. A total of 11 articles were included in the review. The PRISMA flow diagram is shown in Figure 1.

Table 1: Databases accessed

Database	Hit
Medline	62
Scopus	153
Embase	324
APA PsycINFO	74
ScienceDirect	1535
CINAHL	62
Total	2200

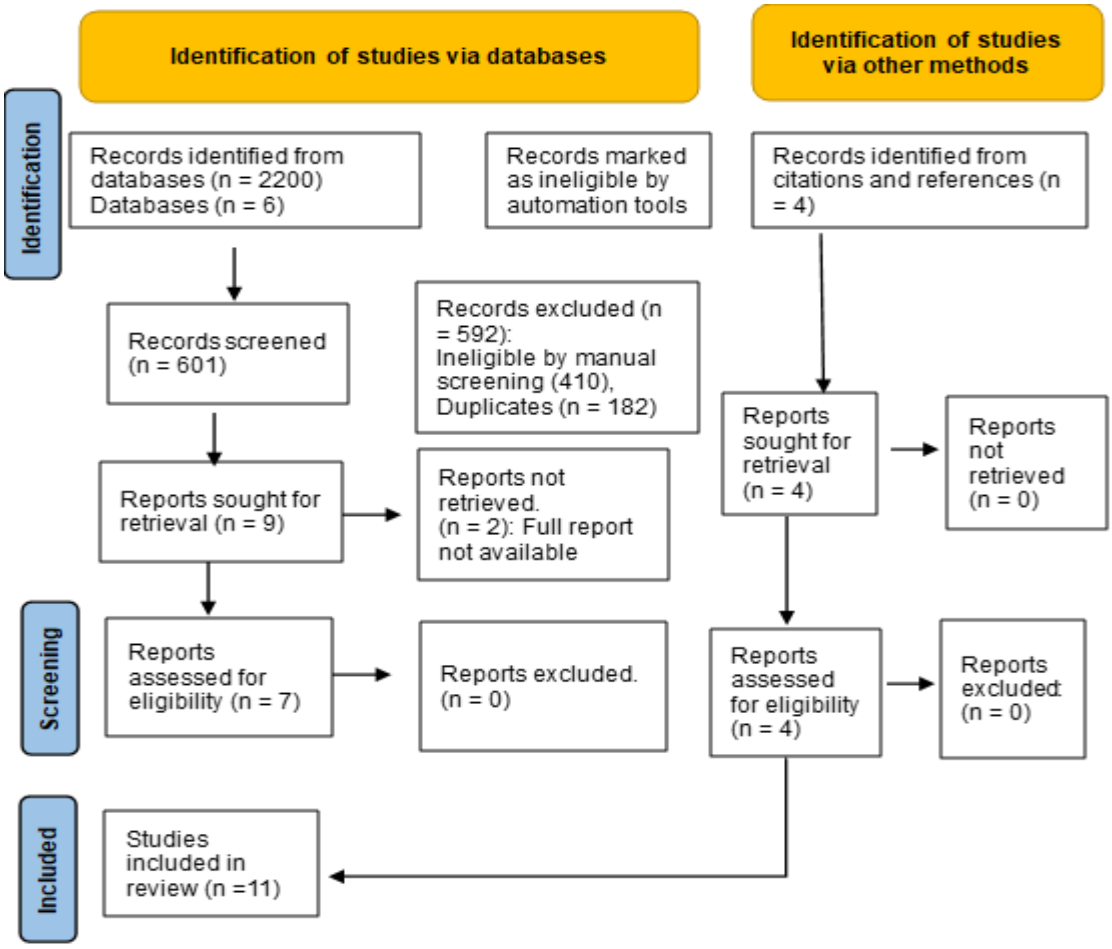

Figure 1: PRISMA Flow diagram

Study Characteristics

This review included 11 studies from Nigeria and Ghana. Eight of the included studies were from Nigeria. [12,13,15–17,219,21,22] And 3 from Ghana.[14,18,20] Five (45.5%) of the studies were cohort studies, 4 (36.4%) cross-sectional. And 1 (9.1%) each case-control and case series. The majority of the studies, 9

(81.8%), were cross-sectional studies. Ten (90.9%) of the studies were conducted among adult populations and 1 study was among children. The total sample size from all studies was 6971, with sample sizes ranging from 2 to 4898. From all the studies that reported sex, males were 3982 accounting for a higher proportion (57.1%) of this sample size, while females were 2867 (42.9%). Details on study characteristics are shown in Table 2.

Table 2: Study characteristics

S/N	Author	Year	Country	State	Study title	Study aim	Study design	Sample population	Sex		Sample size
									Male	Female	
1	Adam G. et. al.	2018	Ghana	Kumasi	Surgical Oncology at a Major Referral Center in Ghana: Burden, Staging, and Outcomes.	To describe the presentation and outcomes of patients with solid cancers managed at a tertiary hospital in Ghana	Cross-sectional	Adults	82	261	343
2	Adisa A. et. al.	2017	Nigeria	Osun	Early Experience with Stapled Gastrointestinal Anastomoses in a Nigerian Hospital	To describe the outcome of the initial experience with stapled gastrointestinal anastomoses in a semi-urban patient population.	Cross-sectional	Adult males and females	7	12	19
3	Agyemang-Yeboah F. et al	2018	Ghana	Kumasi	Colorectal cancer survival rates in Ghana: A retrospective hospital-based study	To investigate the survival rate of colorectal cancer and its prognostic factors among patients	Cross-sectional	Adults	127	94	221
4	Ayandipo O et. al.	2020	Nigeria	Oyo	Perioperative Morbidity and Mortality after Emergency and Elective Colon and Proximal Rectal Surgery in Ibadan	To review the outcome of emergency and elective colon and proximal rectal cases with regards to perioperative morbidity and mortality	Cross-sectional	Adults	466	351	817
5	Ayoade B. et al	2019	Nigeria	Ogun	Palliative surgery for cancer in southwest Nigeria	To describe the spectrum of palliative surgical procedures carried out on cancer patients	Cross-sectional	Adults	65	26	91
6	Bediako-Bowan et al	2023	Ghana	Accra	Morbidity and oncological outcomes after intersphincteric resection of the rectum for low-lying rectal cancer: experience of a single centre in a lower-middle-income country	To assess morbidity, mortality, and oncological outcomes associated with ISR of the rectum and determine the factors contributing to them	Cross-sectional	Adults	50	52	102

7	Ibrahim M. et al	2014	Nigeria	Kano	Carcinoma of the colon in children with metastases to the duodenum: Report of two cases and management reflections	To describe 2 cases of colon cancer in children	Case series	Children	1	1	2
8	Ogbuanya A.U et al.	2022	Nigeria	Ebonyi	Mortality audit in general surgery unit and lessons learned at a Nigerian tertiary hospital: a single centre observational study	To determine the pattern and factors that influence mortality in the general surgery unit of the facility	Case control	Adults	2988	1910	4898
9	Sharma A. et al	2020	Nigeria	South-west, Nigeria	Treatment of colorectal cancer in Sub-Saharan Africa: Results from a prospective Nigerian hospital registry	To investigate the nature of colorectal cancer treatment being offered and received in Nigeria	Cross-sectional	Adults	162	138	300
10	Theyra E. et. al.	2022	Nigeria	Kaduna	Management and Outcome of Colorectal Cancer in a Resource-Limited Setting: Ahmadu Bello University Teaching Hospital, Zaria, Nigeria	To assess the treatment options and outcome of colorectal cancer patients in a tertiary institution, in Northwestern,	Cross sectional	Adults			122
11	Yawe K. T. et al	2016	Nigeria	Borno	Surgical site infection after colorectal cancer surgery in Maiduguri, north-eastern Nigeria	To determine the incidence of SSIs in colorectal cancer patients who had colorectal surgery in our centre, and to identify the risk factors for developing SSIs in these patients.	Cross-sectional	Adult males and females	34	22	56

Risk of Bias Assessment

The RoB assessment (Tables 3-6) of the 11 studies was carried out using the Joanna Briggs Institute (JBI) critical appraisal tools for cohort, cross-sectional studies, case control and cohort series studies. Two independent reviewers (JHZ and EOO) assessed the RoB for the studies, and a third reviewer (TOT) resolved conflicting assessments. Ten studies were adjudged to have moderate RoB,[12-14, 16-21] while two were assessed to have high RoB.[15,22] The cohort studies had sound methodology in outcome measurement but were limited in identifying and controlling for confounders. There was also limited reporting in follow up. The cross-sectional studies had some rigour in definition of populations and exposures but were limited in addressing confounders. The case control and case series studies both had high RoB largely due to the non-clarity of inclusion and absence of analytical rigour.

Table 3: JBI Appraisal for Cross-Sectional Studies

Study	Similar groups & same source ?	Exposure measured similarly?	Exposure valid/ reliable?	Confounders identified ?	Strategies for confounding?	Outcome free at start?	Outcomes valid/ reliable ?	Follow-up long enough?	Follow-up complete /described?	Strategies for incomplete follow-up?	Appropriate statistics?	Overall RoB
Adam G. et.al.	NA	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Unclear	No	Yes	**Moderate**
Agyemang-Yeboah F. et.al.	NA	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Unclear	No	Yes	**Moderate**
Bediako-Bowan A. et.al.	NA	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Unclear	Unclear	Yes	**Moderate**
Sharma A. et.al.	NA	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Unclear	Unclear	Yes	**Moderate**
Yawe K. et.al.	NA	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Unclear	No	Yes	**Moderate**

Table 4: JBI Appraisal for Cross-Sectional Studies

Authors	1. Were the criteria for inclusion in the sample clearly defined?	2. Were the study subjects and the setting described in detail?	3. Was the exposure measured in a valid and reliable way?	4. Were objective, standard criteria used for measurement of the condition?	5. Were confounding factors identified ?	6. Were strategies to deal with confounding factors stated?	7. Were the outcomes measured in a valid and reliable way?	8. Was appropriate statistical analysis used?	Quality
Adisa A. et. al.	Yes	Yes	Yes	Yes	Unclear	No	Yes	Yes	**Moderate**
Ayandipo et al	Yes	Yes	Yes	Yes	Unclear	Unclear	Yes	Yes	**Moderate**
Ayoade et al	Yes	Yes	Yes	Yes	Unclear	No	Yes	Yes	**Moderate**
Theyra E. et. al.	Yes	Yes	Yes	Yes	Unclear	No	Yes	Yes	**Moderate**

Table 5: JBI Appraisal for Ogbuanya A. et. al.,2022 (Case-Control)

Criteria	Responses
1. Were the groups comparable other than the presence of disease in cases or the absence of disease in controls?	Unclear
2. Were cases and controls matched appropriately?	Unclear
3. Were the same criteria used for identification of cases and controls?	Yes
4. Was exposure measured in a standard, valid and reliable way?	Yes
5. Was exposure measured in the same way for cases and controls?	Yes
6. Were confounding factors identified?	Unclear
7. Were strategies to deal with confounding factors stated?	Unclear
8. Were outcomes assessed in a standard, valid and reliable way for cases and controls?	Yes
9. Was the exposure period of interest long enough to be meaningful?	Unclear
10. Was appropriate statistical analysis used?	Yes
Risk of Bias	**High**

Table 6: JBI appraisal for Ibrahim M. et al.,2014 (Case Series)

Criteria	Responses
1. Were there clear criteria for inclusion in the case series?	Unclear
2. Was the condition measured in a standard, reliable way for all participants included in the case series?	Yes
3. Were valid methods used for identification of the condition for all participants included in the case series?	Yes
4. Did the case series have consecutive inclusion of participants?	Yes
5. Did the case series have complete inclusion of participants?	Unclear
6. Was there clear reporting of the demographics of the participants in the study?	Yes
7. Was there clear reporting of clinical information of the participants?	Yes
8. Were the outcomes or follow-up results of cases reported?	Yes
9. Was there clear reporting of the presenting site(s)/clinic(s) demographic information?	Unclear
10. Was statistical analysis appropriate?	N/A
Risk of Bias	**High**

Type of Surgical Resection

We extracted data from 11 studies. More (643) cases of CRC for which surgery was performed were emergency cases with 435 elective cases. The mode of presentation was reported by 3 (27.2%) of the studies. The other eight studies did not state clearly whether the cases of CRC treated surgically were elective or emergency. The majority of the studies reported the site of surgery; the most common sites were the colon and rectum, followed by the duodenum and ileum. About half (50.7%) of the surgeries performed for CRC treatment were hemicolectomies; right hemicolectomy – 29.5%, left hemicolectomy – 11.2%, and extended right hemicolectomy – 10.0%. Others performed were low anterior resection – 17.2%, total/subtotal resection of the rectum – 14.0%, inter-sphincteric resection of the rectum – 12.2% and abdominoperineal resection – 5.9% (Figure 2). For 3 of the studies, the type of surgical resection for CRC treatment was not stated. Details of the modes of presentation and type of surgical resection are shown in Table 7.

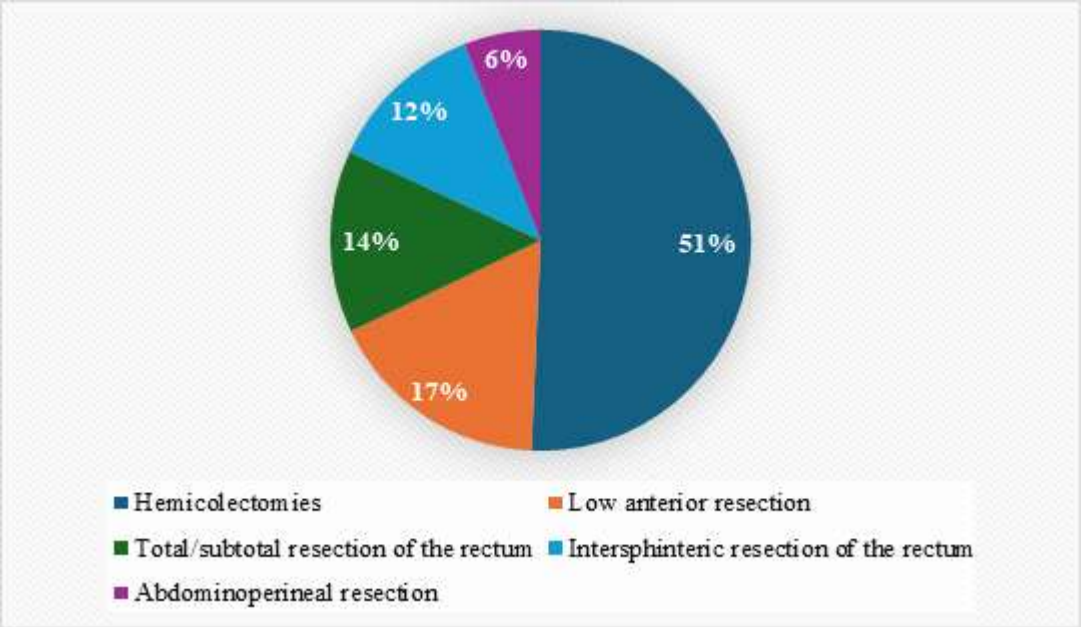

Figure 2: Types of Surgical Resection

Table 7: Type of colorectal cancer surgery

S/N	Author	Year	Mode of presentation		Site of surgery	Type of surgery						
			Elective	Emergency		Right HC	Left HC	Extended right HC	Low Anterior Resection	Abdomino-perineal resection	Inter-sphincteric resection of the rectum	Total or subtotal colectomy
1	Adam G. et. al.	2018	_	_		_	_	_	_	_		_
2	Adisa A. et al	2017			Colon, rectum	4	2		2			
3	Agyemang-Yeboah F. et al	2018	96	49								
4	Ayandipo O. et. al.	2020	337	594	Colon, Rectum	152	67	83	115			113
5	Ayoade B. et al	2019										
6	Bediako-Bowan A. et al	2023			Rectum						102	
7	Ibrahim M. et. al.	2014	2		Colon, Duodenum	2						
8	Ogbuanya A.U et.at.	2022										_
9	Sharma A. et al	2020			Colon, rectum	63	12		16			4
10	Theyra E. et. al.	2022	_	_	Colon, Iluem	15	12		10	21		
11	Yawe K. T. et al	2016			Colon,rectum, perineal organs	10				28		

HC Hemicolectony

Postoperative Complications

Complications of surgical treatment for CRC (Figure 3) were clearly reported by 10 of the 11 studies we reviewed. A total of 579 postoperative complications were reported. Of these complications, surgical site infection was the most reported – 165 (28.5%) and the least reported was pneumonia – 2(0.3%). Other postoperative complications reported were as follows: death – 144 (24.9%), fascial/wound dehiscence – 67 (11.6%), bowel obstruction – 59 (10.2%), fistulae – 56 (9.7%), anastomotic leak – 34 (5.9%), bleeding – 8 (1.4%) and others (ascites, hepatomegaly, gangrene and prolapse) – 44 (7.6%). Details of postoperative complications are shown in Table 8.

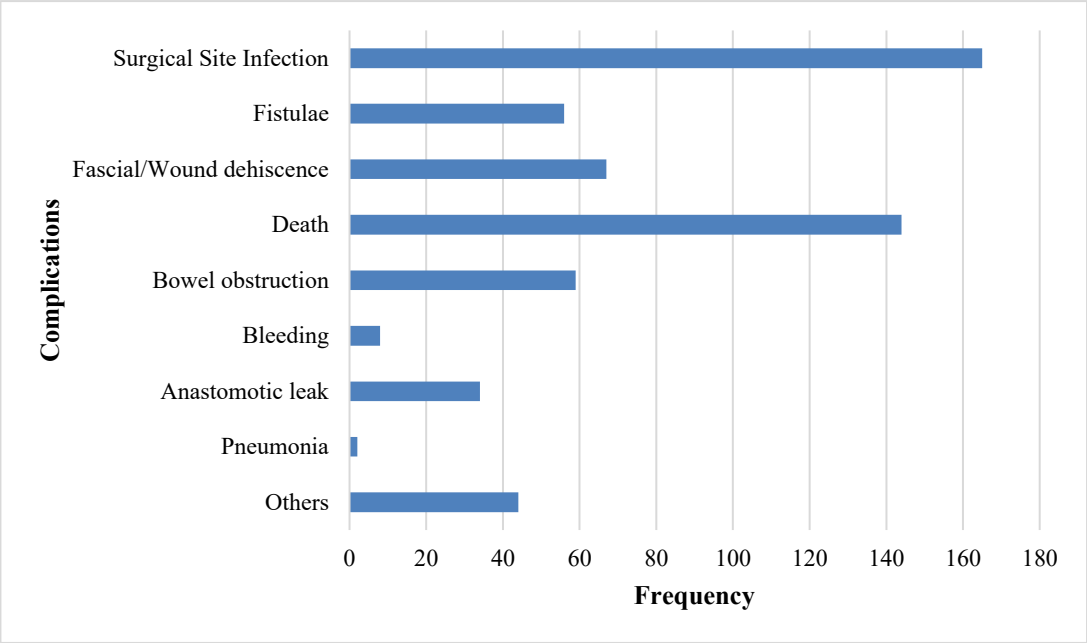

Figure 3: Postoperative Complications

Table 8: Post-operative complications of colorectal cancer surgery

S/N	Author et. al.	Year	Anastomotic leak	Surgical Site Infection	Bleeding	Bowel obstruction	Fistula	Pneumonia	Abscess	fascial/ wound dehiscence	Death	Others (Specify)
1	Adam G. et. al.	2018		_	_	_	_	_	_	_	24	_
2	Adisa A. et al.	2017	0	_	_	0	_	_	_	_	_	_
3	Agyemang-Yeboah F. et al	2018	-	-	-	-	-	-	-	-	-	-
4	Ayandipo O. et. al.	2020	34	112	-	59	37	-	-	67	56	14 Gangrene, 29 Prolapse
5	Ayoade B. et al	2019		-	-	-	-	-	-	-	4	-
6	Bediako-Bowan A. et al	2023	-	-	6	-	-	-	-	-	13	-
7	Ibrahim M. et al	2014	-	-	-	-	-	-	-	-	1	1 (ascites, hepatomegaly)
8	Ogbuanya A.U et.at.	2022	-	-	-	-	-	-	-	-	29	-
9	Sharma A. et al	2020	-	34	2	-	19	2	-	-	-	-
10	Theyre H. eya. al.	2022	-	-	-	-	-	-	-	-	17	-
11	Yawe K. T. et al	2016	-	19 (33.9%)	-	-	-	-	-	-	-	-

Discussion

This systematic review sets a precedence in the integration of existing knowledge on CRC in the West Africa subregion, specifically focusing on Nigeria and Ghana. We aimed to explore the complications following CRC surgeries in these two countries. Our review involved 11 studies and a pooled sample size of 6971. The studies spanned 10 years between 2014 and 2023 with most being from Nigeria. This regional disparity in the number of studies may suggest disparities in the burden of colorectal diseases, health research output, or infrastructure and research funding in these countries. Most of the studies were cross-sectional studies that provided the prevalence of these complications. Longitudinal studies would have captured how complications developed over time in relation to postoperative management. The findings of our review showed that more cases of CRCs were reported in males and the majority occurred in adult populations. This is in keeping with research evidence as CRC occurs more in males and incidence increases with advancing age. [8,23]

Knowledge and understanding of the mode of presentation of CRC patients is important for assessing the quality of care and the outcomes of treatment. However, only about a quarter of the studies in this systematic review reported the mode of presentation of the patients before surgeries. Among those, most of the cases of CRC in our review presented as emergencies. This differs from research done in Yemen - a developing country, and some developed countries.[9,24] Though our search strategy focused on CRC cases associated with surgical interventions and these interventions may be more likely in emergency scenarios, other studies report higher elective than emergency presentations in the context of only surgical interventions.[24] This suggests cancer presentation in developing countries like Nigeria and Ghana is usually in the advanced stages when acute complications may have arisen, necessitating emergency interventions. This turn of events tends to have worse outcomes due to a lack of pre-operative planning and preparation. Inherently, this may be a pointer to limited access to screening and diagnostic tools which is a known problem in low-resource settings like the region of our study.

The most common sites of surgery reported in this review were the colon and rectum which is in keeping with the sites of CRCs.[25,26] However, few studies reported other site involvement like the duodenum and the ileum. This may be indicative of advanced disease with metastasis to distant sites. Most surgical resection methods reported were hemicolectomies with right hemicolectomies accounting for a larger proportion. This reflects that most CRCs reported by studies in this review originate in the right colon, however, the epidemiology of CRC globally shows that most originate from the left colon.[25] Despite the complexity and higher risks of complications associated with rectal surgeries,[27] Some studies in this review reported extensive rectal procedures like anterior resection, total/sub-total resection, inter-sphincteric resection, and abdominoperineal resection which are complex and associated with higher risk of complications. This may reflect a lack of screening programme which could have picked this disease very early such that minimal invasive procedures like polypectomy, trans-anal local excision or trans-anal endoscopic microsurgery could be performed thereby reducing the rate of complications associated with these extensive surgeries.

Our review found SSI to be the most reported complication of CRC surgeries similar to what is obtainable in some other regions.[9] This points to the high load of bacteria in the colon, possibility of gross intraoperative contamination and the high number of emergency surgeries which on its own is associated with increase rate of SSI. The occurrence of SSIs can lead to prolonged hospital stays, increased use of antibiotics, the potential for further complications such as sepsis, and increased cost of care.[28]

A fifth of the complications reported in this review was death. This is alarming compared to global standards; mortality rates following CRC surgery are typically below 5% in high-income countries.[26] This finding, however, reflects the reality in sub-Saharan Africa.[29] Factors that may contribute to the high mortality in the region include late-stage presentation of CRC patients, suboptimal peri-operative care, limited access to intensive care facilities, and the prevalence of emergency surgeries, which often carry higher risks. Reducing mortality after CRC surgery requires improvements in both surgical techniques and

peri-operative care. This includes better peri-operative management, improved surgical planning, and access to critical care for patients with serious post-operative complications. In addition, there needs to be a shift in focus to early detection of CRC to enable more elective surgeries which could significantly reduce mortality.

Other complications identified in this review include wound dehiscence, bowel obstruction, fistulae, and anastomotic leaks. These are all serious complications that can have devastating effects on patient recovery and long-term outcomes. They often require additional surgeries or prolonged hospitalization. These complications may point to issues with surgical technique, peri-operative patient management, or both. They may be addressed by improved surgical and post-operative management skills training and the use of minimally invasive techniques, when possible, to reduce iatrogenic bowel injury.

The low incidence of pneumonia and postoperative bleeding is encouraging, as these are common complications in surgical procedures. However, these rates may be under-reported, as respiratory complications and bleeding may be less frequently documented in resource-limited settings where post-operative monitoring may be sub-optimal. Other complications found in our review include ascites, hepatomegaly, gangrene, and prolapse. Ascites and hepatomegaly may suggest metastasis to the peritoneal cavity or liver. It could also be due to an underlying liver disease. This underscores the importance of pre-operative patient assessment and preparation to avoid co-morbidities complicating CRC surgeries. Gangrene and prolapse are serious complications that reflect a failure of tissue healing and surgical integrity, indicating a need for more intensive post-operative care and possibly better surgical planning to reduce strain on tissues.

Implications for public health

CRC patients in the region present late in advanced cancer stages. This highlights the need for public health education and screening for at-risk populations. There may also be disparities in who receives elective vs. emergency care by place of residence. Patients in rural or low-income areas may be more likely to present as emergency cases due to reduced access to healthcare services, including preventive care and early diagnosis. Policymakers should focus on reducing these inequities to improve overall health outcomes. Enhancing surgical infrastructure and ensuring that surgeons have access to the latest techniques and technologies, such as minimally invasive surgery, is essential. Given the high rate of rectal surgeries, specialised training in sphincter-preserving surgeries could reduce complications and the long-term impact on the quality of life of patients. The governments in this region should sponsor surgeons to go overseas for specialised training or invite specialists to provide training for surgeons locally.

Strength of the study

This body of work pioneers systematic reviews on CRC surgery and complications in this region and it identifies important research gaps that call for further exploration.

Our review was the first of its kind in the region and importantly identifies research gaps that call for further exploration. This review covered literature over the last 10 years. This provides sufficient evidence to make relevant recommendations on the subject matter.

Limitations

The strength of this review may be limited by the quality of most of the studies. The majority of which had moderate RoB. More so, only 11 articles were included in this review, drawn only from two countries in the West African region. This both increases the risk of publication bias as only studies with significant findings may have been published and limits the generalisability of the findings. A larger number of articles involving both Anglophone and Francophone countries may have strengthened the evidence.

Recommendations and future research

There is an urgent need to improve infection prevention and control, surgical techniques, and post-operative care. Investments in healthcare infrastructure, training, and early detection programs are essential to reduce the complications associated with CRC surgeries. In addition, more comprehensive and standardized reporting of post-operative outcomes is critical for advancing the quality of surgical care in this region.

Future research should focus on improving early detection, standardizing data collection and reporting, identifying risk factors for post-operative complications, and addressing the gaps in surgical capacity and expertise. Addressing these issues will be essential for reducing CRC morbidity and mortality in the West African context. In addition, researchers should consider longitudinal studies which will provide stronger evidence and temporal relationships, and as such show the progression in the development of complications in relation to post-operative management. Finally, future studies should involve both Francophone and Anglophone countries.

Conclusion and recommendations

This review has explored post-operative complications of CRC surgeries in Nigeria and Ghana. It highlights significant patterns in CRC surgeries in these West African countries, with a high prevalence of emergency cases and a focus on hemicolectomies and rectal surgeries. There is a significant burden of postoperative complications following CRC surgery in West Africa. Surgical site infections, mortality, and wound dehiscence were among the most common complications. The findings from our review suggest that limited access to screening, late presentation, surgical skills training, surgical infrastructure, and insufficient reporting standards are key challenges that need to be addressed in the region.

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