Onono R.K., Munene S.M., Thiauru L.M., Mapesa J.O. 2025. "An analysis of diets among patients with gastrointestinal disorders and a comparison of treatments, supplement use, and symptoms in Inflammatory Bowel Disease compared with other gastrointestinal disorders at Kenyatta National Hospital, Kenya." *World Nutrition*, *16*(4), December, 118–125. https://doi.org/10.26596/wn.2025164118-125

Research

An analysis of diets among patients with gastrointestinal disorders and a comparison of treatments, supplement use, and symptoms in Inflammatory Bowel Disease compared with other gastrointestinal disorders at Kenyatta National Hospital, Kenya

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Keywords: inflammatory bowel disease, kenya, diet, nutritional supplements, diarrhea, sub-saharan africa

https://doi.org/10.26596/wn.2025164118-125

World Nutrition 2025;16(4):118-125

Background

Inflammatory Bowel Disease (IBD) is a chronic gastrointestinal disorder (GD) in which both pharmacological treatment and dietary practices may influence symptom control, nutritional status, and disease progression. Dietary practices are integral to symptom management in IBD, yet context-specific data from sub-Saharan Africa are limited.

Objective

This study aims to compare medication use, self-imposed dietary restrictions, and nutrition-related care between patients with IBD and those with other gastrointestinal disorders, to examine how these factors are associated with common symptoms. In addition, we describe patient-reported dietary intake patterns.

Methods

We conducted a hospital-based cross-sectional study at Kenyatta National Hospital (KNH). Adults (⩾18 years) with confirmed IBD (n=40) and with other GD (n=79) were enrolled. Data were collected via structured questionnaires and records review. Analyses used descriptive statistics and χ^2/Fisher's exact tests (two-sided, α=0.05).

Results

Use of core IBD pharmacotherapy was higher in IBD than GD (100% vs 75.3%; p<0.001). IBD patients more frequently reported therapeutic supplements (62.5% vs 39.2%; p=0.016) and preventive supplements (40.0% vs 15.2%; p=0.003). Restrictive therapeutic diets were common (47.5% IBD vs 34.2% GD; p=0.159). Diarrhea was more frequent in IBD (75.0% vs 50.6%; p=0.011); vomiting did not differ. Rates of documented nutritional deficiency (~60%) and malnutrition (~40%) were similar across groups. Diet intake patterns for both groups combined showed high reliance on staples and plant-based proteins, with selective avoidance of animal fats and some animal proteins.

Conclusions

We conclude that IBD care at KNH features higher use of core medications, greater use of supplements, and higher diarrheal burden than for other GD. Patient-directed dietary restriction and malnutrition were equally common in both groups. Routine nutrition screening and structured, individualized counselling, aligned with pharmacotherapy, may improve adequacy of dietary intakes while mitigating symptoms.

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INTRODUCTION

Inflammatory bowel disease (IBD), comprising Crohn's Disease (CD) and ulcerative colitis (UC), is a chronic, relapsing, immune-mediated disorder with substantial impacts on quality of life and on health systems (McDowell et al. 2025; Muzammil et al. 2023). Once considered a disease of high-income regions (Hracs et al. 2025; Kaplan & Windsor, 2021a), IBD has expanded globally over the last three decades, with more than 6.8 million people affected, though the highest prevalence is in North America and Europe (Ng et al. 2017a; Zhang et al. 2024). Environmental shifts associated with urbanization, dietary westernization, altered microbiota, sanitation changes, and antibiotic exposure are implicated in rising incidences beyond traditional hotspots (Calvez et al. 2025; Ananthakrishnan et al. 2020; Vinogradova et al. 2024).

In sub-Saharan Africa (SSA), including Kenya, IBD is likely under-recognized due to overlapping symptoms with infectious enteropathies, limited endoscopy and histopathology capacity, and low public and provider awareness (Musa et al. 2025; Watermeyer et al. 2023a). Although emerging reports from South Africa, Nigeria, and Ghana describe rising cases of UC and CD, misdiagnosis continues to delay appropriate care, contributing as well to a paucity of region-specific data on modifiable factors, particularly diet and medication use (Hodges & Kelly, 2020; M'Koma, 2013). These trends, alongside the high cost of IBD-specific medications and specialist care, further exacerbate the disease burden in SSA (Istratescu et al. 2024; Jamal et al. 2025).

In Africa, reported cases of IBD remain relatively low compared to Western nations, but trends indicate increasing incidence, particularly in urban centers such as Nairobi (Hodges & Kelly, 2020; Zhou et al. 2023). The growing consumption of ultra-processed foods and evolving water and sanitation conditions may intersect with patient-reported modulation of diet-related symptoms (Boyce et al. 2019; Awori et al. 1972; Wanjohi et al. 2025). Many patients adopt self-directed dietary restrictions, partly because individualized professional dietary guidance is limited (Mourad et al. 2024). Generating local evidence on dietary exposures, supplement use, and supportive therapies, alongside symptom profiles and nutritional status (Xiao et al. 2024), can inform pragmatic, context-appropriate care pathways in settings with constrained specialist services and variable food security. Thus, this study aims to describe dietary patterns and common food-related restrictions among Kenyan patients with IBD compared with those with other gastrointestinal conditions, and to explore how dietary choices vary by disease severity and medication use within the IBD group.

MATERIALS AND METHODS

STUDY AREA AND PARTICIPANTS

We conducted a hospital-based cross-sectional study at Kenyatta National Hospital (KNH), Nairobi, Kenya. It is the country's largest national referral and teaching hospital, serving a broad patient base from Nairobi County and other regions of Kenya. All adults (⩾18 years) attending the outpatient gastroenterology clinics were screened and enrolled into two groups: (i) patients with a confirmed diagnosis of IBD and (ii) patients with other gastrointestinal disorders (GD). In total, 119 participants were recruited, all those who visited the clinic between September 2024 and March 2025. IBD diagnoses were verified from endoscopy and histopathology records. Patients unable to provide informed consent or complete the interview were excluded.

DATA COLLECTION

Data were collected using a structured, interviewer-administered questionnaire complemented by a review of patients' hospital records. The questionnaire captured information on socio-demographic characteristics, dietary triggers, medication use, related dietary modifications, and disease severity indicators. Clinical records were reviewed to confirm diagnosis, treatment history, and relevant laboratory findings. The data collection team underwent prior training to ensure standardized administration of the questionnaire and accurate extraction of clinical information.

DATA ANALYSIS

Quantitative data were analyzed using SPSS version 26. Descriptive statistics were used to summarize socio-demographic, clinical, and dietary characteristics of participants. Group differences for categorical variables were assessed using χ^2 tests (with Fisher's exact test where expected cell counts were <5). All tests were two-sided with α=0.05. Missing data were handled by pairwise exclusion for all inferential analyses; for descriptive summaries, available-case denominators are shown. Specifically, for the binary endpoints Core IBD therapy and adjunct comorbidity care, records with missing values in the outcome or any included covariate were excluded pairwise from the relevant analyses.

Dietary intake data from both groups of patients diagnosed with gastrointestinal diseases were analyzed together and categorized by frequency of consumption into four levels: Always, Occasionally/Sometimes, Rarely, and Never. Each food item in the dataset was grouped into one of five logical dietary categories based on common nutritional classifications: staples (grains, cereals, tubers), proteins (beef, mutton, pork, lamb, poultry, eggs, fish, legumes, lentils, milk, yoghurt, cheese, cream), fats/oils (butter, seed oil, animal fat, plant oil), fruits & vegetables (fruits, leafy green vegetables), and others (sugar, spices and herbs). For each category, the total number of consumption responses was computed by summing values across all frequency levels. To analyze dietary behavior, responses were grouped into two broader frequency types: frequent consumption (Always and Occasionally/Sometimes) and infrequent consumption (Rarely and Never). The proportions of frequent and infrequent responses were then calculated as percentages of the total responses for each category. To further explore dietary preferences between animal-based and plant-based nutrition sources, protein and fat items were sub-categorized into animal-derived (e.g., beef, milk, butter) and plant-derived (e.g., legumes, seed oils) groups. The results were compiled into two summary tables: one showing overall category-level consumption trends, and another specifically contrasting animal and plant-based proteins and fats.

ETHICAL CONSIDERATIONS

All participants gave their informed consent, both verbally and in writing, before any data were collected. Approval for data collection was awarded by the Kenyatta National Hospital-University of Nairobi Ethical Review Committee (KNH-UoN ERC), P38/01/2024, and by the National Commission for Science, Technology & Innovation (NACOSTI), NACOSTI/P/24/39330. All data from clinical records were also collected confidentially, with participant identifiers removed to maintain privacy and comply with ethical guidelines.

RESULTS

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF STUDY PARTICIPANTS

The study sample consisted of 119 participants, with 33.6% diagnosed with IBD and 66.4% with other GD as shown in Table 1. Gender distribution was nearly equal across both groups. A slight majority of patients were 31–50 years of age. The majority had no formal education (61.3%) and were unemployed (52.1%), with most, 73.9%, reporting monthly incomes below KES 5,000 [USD 38]. Notably, all participants earning above KES 20,000 were from the IBD group. Regarding clinical diagnoses, ulcerative colitis (87.5%) was the most common form of IBD, while gastritis (73.4%) dominated among other GD patients. A few cases of CD (7.5%), pancolitis (5.0%), and celiac sprue (0.8%) were also identified. Most diagnoses were made between 2021 and 2025 (81.5%), reflecting a recent increase in recognition and diagnosis of both IBD and other GD at the Kenyatta National Hospital.

Table 1: Socio-Demographic and Clinical Characteristics of Study Participants (n = 119)

Characteristic	Description	IBD (%)	Other GD (%)	Total (%)
Gender	Male	21 (52.5)	38 (48.1)	59 (49.6)
	Female	19 (47.5)	41 (51.9)	60 (50.4)
Age (years)	<20 years	5 (12.5)	6 (7.6)	11 (9.2)
	21 – 30 years	5 (12.5)	8 (10.1)	13 (10.9)
	31 – 40 years	9 (22.5)	23 (29.1)	32 (26.9)
	41 – 50 years	12 (30.0)	17 (21.5)	29 (24.4)
	51 – 60 years	4 (10.0)	11 (13.9)	15 (12.6)
	>60 years	5 (12.5)	14 (17.7)	19 (16.0)
Marital Status	Married	21 (52.5)	42 (53.2)	63 (52.9)
	Single	18 (45.0)	34 (43.0)	52 (43.7)
	Separated/Divorced	1 (2.5)	2 (2.5)	3 (2.5)
	widowed	-	1 (1.3)	1 (0.8)
Education Level	No formal education	23 (57.5)	50 (63.3)	73 (61.3)
	Primary	8 (20.0)	4 (5.1)	12 (10.1)
	Secondary	8 (20.0)	19 (24.1)	27 (22.7)
	Post-secondary	1 (2.5)	6 (7.6)	7 (5.9)
Source of Income	Employed	5 (12.5)	10 (12.7)	15 (12.6)
	Unemployed	19 (47.5)	43 (54.4)	62 (52.1)
	Self employed	9 (22.5)	16 (20.3)	25 (21.0)
	Casual laborer	4 (10.0)	7 (8.)	11 (9.2)
	Retired	3 (7.5)	3 (3.8)	6 (5.0)
Income (KES)	<5,000	28 (70.0)	60 (75.9)	88 (73.9)
	5,001-10,000	1 (2.5)	9 (11.4)	10 (8.4)
	10,001-15,000	3 (7.5)	4 (5.1)	7 (5.9)
	15,000-20,000	1 (2.5)	6 (7.6)	7 (5.9)
	>20,000	7 (17.5)	-	7 (5.9)
Principal diagnosis	Total patients	40 (33.6)	79 (66.4)	119 (100.0)
	Pancolitis	2 (5.0)	-	2 (1.7)
	Ulcerative Colitis	35 (87.5)	-	35 (29.4)
	Crohn's Disease	3 (7.5)	-	3 (2.5)
	Gastritis	-	58 (73.4)	58 (48.7)
	Gastroenteritis	-	15 (19.0)	15 (12.6)
	Celiac Sprue	-	1 (1.3)	1 (0.8)
	Irritable Bowel Syndrome	-	5 (6.3)	5 (4.2)
Period of diagnosis	2009- 2014	3 (2.5)	-	3 (2.5)
	2015- 2020	13 (10.9)	6 (5.0)	19 (16.0)
	2021- 2025	24 (20.2)	73 (61.3)	97 (81.5)

Note: 1 USD= KES 130

TREATMENT AND NUTRITIONAL CARE IN INFLAMMATORY BOWEL DISEASE AND OTHER GASTROINTESTINAL DISORDERS

Table 2 compares treatment, supportive care, and nutritional status between patients with IBD and GD. As expected, the use of core IBD therapy, which includes anti-inflammatory, immunomodulatory, and pain management approaches, was universal among IBD patients (100%). In contrast, it was reported in about three-quarters of GD patients (75.3%). This difference was statistically significant ($p < 0.001$). By contrast, the use of adjunct comorbidity care such as anti-infectives and other systemic medicines was comparable between the two groups ($p = 0.849$). The use of therapeutic supplements was higher among IBD patients (62.5%) compared with GD patients (39.2%) ($p = 0.016$). Similarly, preventive supplements to address potential deficiencies were more commonly reported among IBD patients (40.0%) than GD patients, 15.2% ($p = 0.003$). Although no significant differences were found in diet type ($p = 0.159$) or IV fluid therapy ($p = 0.958$), a restrictive therapeutic diet was followed by 47.5% of IBD patients and 34.2% of GD patients.

In terms of symptoms, diarrhea was significantly (p = 0.011) more common among IBD patients (75.0%) compared with GD patients (50.6%), whereas vomiting did not differ (p = 0.267). The prevalence of nutritional deficiencies and overall nutritional status was similar across both groups (p = 0.892 and p = 0.249, respectively).

Table 2: Comparison of treatment modalities, clinical symptoms, and nutritional status between patients with Inflammatory Bowel Disease and other gastrointestinal disorders

Characteristic	Description	IBD (%)	GD (%)	Total (%)	P based on chi-square
Core IBD therapy	Yes	37 (100)	55 (75.3)	92 (83.6)	
	No	-	18 (24.7)	18 (16.4)	**0.001**
Adjunct comorbidity care	Yes	25 (67.6)	48 (65.8)	73 (66.4)	
	No	12 (32.4)	25 (34.2)	37 (33.6)	0.849
Therapeutic supplements	Yes	25 (62.5)	31 (39.2)	56 (47.1)	
	No	15 (37.5)	48 (60.8)	63 (52.9)	**0.016**
Preventive supplements	Yes	16 (40.0)	12 (15.2)	28 (23.5)	
	No	24 (60.0)	67 (84.8)	91 (76.5)	**0.003**
Therapeutic diet type	Restrictive	19 (47.5)	27 (34.2)	46 (38.7)	
	Non-restrictive	21 (52.5)	52 (65.8)	73 (61.3)	0.159
IV fluid therapy	Yes	16 (40.0)	32 (40.5)	48 (40.3)	
	No	24 (60.0)	47 (59.5)	71 (59.7)	0.958
Diarrhea present	Yes	30 (75.0)	40 (50.6)	70 (58.8)	
	No	10 (25.0)	39 (49.4)	49 (41.2)	**0.011**
Vomiting present	Yes	19 (47.5)	46 (58.2)	65 (54.6)	
	No	21(52.5)	33(41.8)	54(45.4)	0.267
Nutritional deficiency	Yes	24 (60.0)	47 (59.5)	71 (59.7)	
	No	16 (40.0)	32 (40.5)	48 (40.3)	0.892
Nutritional status	Malnourished	18 (45.0)	29 (36.7)	47 (39.5)	
	Well-nourished	22 (55.0)	50 (63.3)	72 (60.5)	0.249

DIETARY INTAKE PATTERNS IN THE COMBINED IBD AND OTHER GASTROINTESTINAL DISORDER GROUPS

Dietary intake patterns in the combined IBD and other gastrointestinal disorder groups are summarized in Figure 1, which shows self-reported consumption frequency across food items on a five-point scale. Staple carbohydrates (grains, cereals, and tubers) dominated the diet, with most respondents reporting "Always" or "Occasionally," while fruits and vegetables were also commonly consumed, often "Always." Plant-based proteins (legumes and lentils) were reported more frequently than several animal proteins. In contrast, animal protein intake was mixed—beef and fish were relatively common, poultry and eggs moderate, and pork, mutton, and lamb were often "Rarely" or "Never." Dairy intake varied, with milk and yoghurt consumed more regularly than cheese and cream; fats and oils also differed, with plant oils commonly used but animal fat and butter often "Rarely/Never." Sugar showed a sizeable "Always" segment, suggesting frequent use, and spices and herbs were regularly consumed by many participants, though not universally.

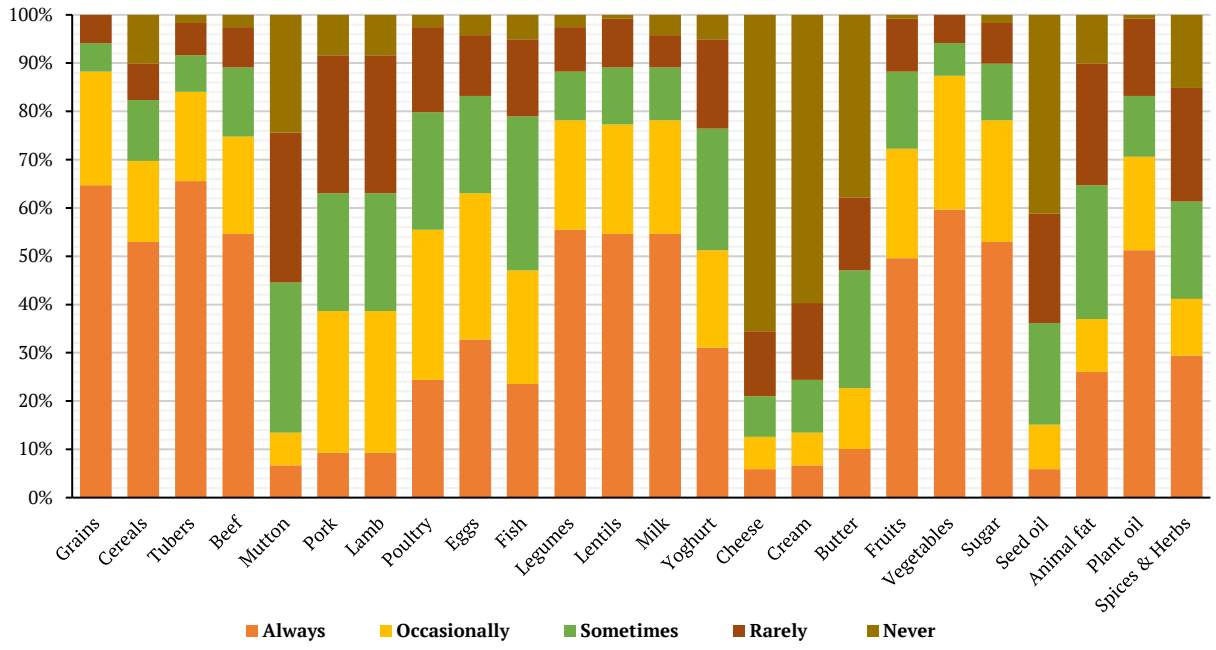

Figure 1: Self-reported frequency of consumption across major food items among all patients with gastrointestinal disorders (n=119)

Table 3 shows the same data, collapsed into food groups and two frequency categories. Staples (80.7%) and fruits and vegetables (79.8%) were the most frequently consumed food groups.

Table 3: Frequency of food/nutrient group consumption among all patients with gastrointestinal disorders

Category	Total Responses	Frequent (%)	Infrequent (%)
Staples	357	80.7	10.6
Proteins	1547	49.4	31.5
Fruits & Vegetables	238	79.8	8.82
Others	238	59.7	24.4
Animal Protein	1309	44.2	35.2
Plant Protein	238	77.7	11.3
Animal Fat	238	29.8	44.1
Plant Fat	238	42.9	40.3

A total of 24 food items were used to calculate the responses in this combined category analysis table.
Others= Sugar; spices and herbs.

DISCUSSION

This study characterizes medication use, diet-related practices, and common symptoms among adults at Kenyatta National Hospital with IBD compared with other GD. Universal use of core pharmacotherapy in IBD aligns with standard care pathways, and greater use of therapeutic and preventive supplements is consistent with guidance to screen for and correct deficiencies and to support adequacy where intake is reduced (Bischoff et al. 2023; Hashash et al. 2024; Larussa et al. 2019; Ribaudi et al. 2025). The predominance of ulcerative colitis among IBD cases in Kenya echoes patterns observed across sub-Saharan Africa, where UC appears more common than CD, potentially reflecting distinct genetic and environmental influences (Oshi 2025). Socioeconomic differences also mirror broader trends; individuals with higher incomes are more likely to receive an IBD diagnosis, potentially due to Westernized diets, better access to diagnostic services, and possibly as reflected in the hygiene hypothesis, whereas lower-income groups are disproportionately affected by acute GDs such as gastritis and gastroenteritis, often driven by infectious pathogens and limited sanitation (Wardle et al. 2017). These clinical and social gradients observed between IBD and GD groups underscore the need for tailored healthcare strategies that address both disease-specific management and the social determinants of health.

Notably, malnutrition and micronutrient deficiency were common in both groups, suggesting the need for routine nutrition screening across gastroenterology services rather than in IBD clinics alone. While a higher prevalence of diarrhea in IBD is expected with active inflammation, comparable overall nutritional risk in GD indicates that case-mix (including gastritis and gastroenteritis) also contributes meaningfully to the nutritional burden. The dietary patterns observed heavy reliance on staple carbohydrates and plant-based proteins with selective avoidance of animal proteins and fats, consistent with emerging evidence on dietary shifts in IBD (Hashash et al. 2024). Such self-imposed restrictions are known to influence nutrient adequacy (Larussa et al. 2019). Overall patterns of care align with contemporary guidance that retains early pharmacological therapy as the cornerstone of IBD management, but also integrates nutrition care with it (Bischoff et al. 2023; Hashash et al. 2024), with supplement use guided by the identification of common deficiencies, including iron, vitamin D, vitamin B_{12}, and calcium (Bischoff et al. 2023; Hashash et al. 2024; Liu et al. 2022; Ribaudi et al. 2025). At the same time, widespread self-directed dietary restrictions, for example, low-residue, lactose-free, or low-FODMAP (Fermentable Oligosaccharides, Disaccharides, Monosaccharides, and Polyols) diets, may jeopardize nutritional adequacy and bone health when prolonged (Godny & Dotan, 2023; Larussa et al. 2019), reinforcing the importance of structured, personalized dietetic counselling so that dietary advice complements pharmacotherapy and avoids unnecessary dietary exclusions (Bischoff et al. 2023; Hashash et al. 2024; Larussa et al. 2019; Watermeyer et al. 2023b).

Restrictive diets were frequently reported, particularly avoidance of high-fiber foods and dairy products. While targeted short-term restriction may reduce symptoms in selected patients, sustained broad restriction risks inadequate intake and bone health consequences (Larussa et al. 2019). Structured, individualized counselling, ideally with a registered dietitian, should balance symptom control with nutrient sufficiency and patient preferences (Bischoff et al. 2023; Hashash et al. 2024; Larussa et al. 2019). In the context of rising IBD burden and service pressures in Africa, alongside worsening diet quality and greater exposure to ultra-processed foods in rapidly urbanizing settings, embedding practical nutrition care within IBD care pathways is essential for resource-constrained health systems in low- and middle-income countries (Bischoff et al. 2023; Hashash et al. 2024; Hodges et al. 2025; Hracs et al. 2025; Kaplan & Windsor, 2021b; Larussa et al. 2019; Ng et al. 2017b; Wanjohi et al. 2024; Watermeyer et al. 2023b).

CONCLUSION

At KNH, a national referral hospital in Kenya, Inflammatory Bowel Disease care is characterized by universal core pharmacotherapy and high supplement use, with frequent patient-directed dietary restriction. Supplement use and diarrheal burdens were found to be higher than in other gastrointestinal disorders. Given high rates of nutritional risk across both groups, routine screening and accessible, individualized nutrition counselling should be integrated into gastroenterology services to prevent deficiencies and avoid unnecessary dietary restrictions.

STRENGTHS AND LIMITATIONS

This study benefits from a real-world clinic population and a head-to-head comparison of IBD patients with a contemporaneous cohort of patients with other gastrointestinal disorders, capturing multiple domains, including medications, supplement use, and symptoms. However, it is limited by its single-center, cross-sectional design and modest sample size of IBD cases, which constrain generalizability and preclude causal inference. Dietary intake was self-reported without a validated instrument; the heterogeneous GD comparison group may have introduced residual confounding, and disease activity indices and biochemical markers were not available for analysis. Finally, no comparison was made between the two groups' diets.

AUTHOR CONTRIBUTIONS

RKO, LMT and JOM conceptualized and designed the study; RKO, SMM and JOM developed the questionnaire. RKO and SMM acquired the data. RKO, LMT and JOM performed data coding and analysis. RKO, SMM and JOM drafted the manuscript, and all authors revised it for important intellectual content. LMT and JOM supervised the project. All authors approved the final version and agree to be accountable for all aspects of the work.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN SCIENTIFIC WRITING

The authors used CHATGPT 4.0 as an editing tool to improve grammar and readability. No part of the content, data analysis, or interpretation was generated by AI. The authors take full responsibility for all aspects of the manuscript.

ACKNOWLEDGEMENTS

We thank Isaac Mukoko for his help with data curation and the staff in the Gastroenterology Department for their support and assistance during data collection. We thank the respondents attending the Kenyatta National Hospital gastroenterology clinics and wards who consented to participate in the study.

FUNDING

None

Received: September 15, 2025; **Revised:** December 9, 2025; **Accepted:** December 19, 2025; **Published:** December 30, 2025

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