

Egyptian patients' Dietary beliefs and behaviors in Inflammatory Bowel Disease and Hospital recommendations: A single-center experience

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Abstract. The abstract provides a concise summary of the study on the dietary beliefs and habits of patients with Inflammatory Bowel Disease (IBD) in Egypt. It encompasses key findings, patient perceptions, dietary practices, and comparisons with international studies. The abstract emphasizes the significance of cultural factors, the preference for personalized diets, and the use of dietary tools in managing IBD symptoms. The study's limitations and implications for patient education are also acknowledged. Overall, the abstract serves as a comprehensive overview, inviting further exploration into the intricate relationship between dietary behaviors and IBD in the Egyptian context.

Keywords: Inflammatory Bowel Disease (IBD), Personalized Diets, Microbiota, Patient Perceptions, Oriental Foods

Introduction

Mechanical In Our country, especially in Upper Egypt, it was noticed a marked increase in the frequency of Inflammatory bowel disease (IBD) both Ulcerative colitis (UC) and Crohn's disease (CD) diagnoses during the most recent 10 years from 1995 to 2009 in Egypt and it is still rising till now [3], Thus, it became crucial to examine the patients' dietary attitudes and practises. Chronic intestinal inflammation that comes and goes is a defining feature of IBD. CD and UC are parts of IBD. The ileum is most frequently affected by CD, which can affect any part of the digestive tract and is

distinguished by skip lesions with confluent deep linear ulcers, aphthous ulcers, cobblestoning, granulomas, deep fissures, fistulae, strictures, and fat wrapping and is frequently rectal sparing [1]. The following clinical symptoms may be present: diarrhoea, stomach pain, loss of weight, malaise, anorexia, or fever [1]. UC is confined to ongoing mucosal inflammation that often affects the rectum and a significant subset of the colon without granulomas [4]. Bloody diarrhoea, rectal bleeding, and urgency are some symptoms of the condition, depending on its degree and severity. [4].

Although the underlying cause of IBD is unknown, research suggests that a genetic predisposition, the intestinal microbiota, and environmental factors all have a role in immune dysfunction [5, 6]. Age, ethnicity, and geographic location all have an impact on IBD rates. Both smoking and childhood infections have been linked to this issue [7].

Regarding the aetiology of IBD, nutrition is a crucial factor to take into account. Regarding immunological tolerance, the gastrointestinal tract and enteric microbiota are well balanced, whereas IBD is characterised by immune dysfunction [8]. IBD's origin is frequently attributed to environmental factors, including the modern western diet [9, 10]. IBD rates rose sharply in the latter decades of the 20th century, especially in wealthy nations [11]. Interestingly, increases in IBD rates have also been observed in countries where the diet is becoming more westernized and in ethnic groups who move to a developed country and adopt a westernized diet [9, 10]. In Egypt, unfortunately, definite changes in dietary habits and lifestyle have occurred over the past two decades in the form of increasing consumption of protein and fat and increasing standards of living, making strict and rapid steps towards the western prototype of diet [12]. This explains clearly why it was noticed a marked increase in the frequency of both UC and CD diagnoses since 1995 up till now [3].

The intestinal microbiota, the immune system, and the function of the epithelial barrier are the three most significant factors in the pathogenesis of IBD. All three of these factors can be modulated and controlled by diet [13, 14]. The quality of life of IBD patients was discovered to be significantly impacted by their food [15–18], and altering diet proved to be a practical tool for patients to manage their IBD [15, 18]. Given the varied nature of IBD, it has been difficult to provide a single dietary recommendation for all IBD patients [15, 19], and the kinds of food that are tolerated widely differ between patients [18, 20].

Inflammatory bowel disease patients are getting more and more interested in non-pharmacologic treatment options. What IBD patients should consume and if food affects the onset, prognosis, and the requirement for

treatment intensification are two of the most commonly asked queries. The most frequent and difficult issue posed to gastroenterologists caring for patients with IBD is specifically the one asking what to eat [21]. Despite the fact that nutrition has taken on a significant role in the prevention and treatment of IBD, there is generally a deficiency of solid scientific data showing which diet is appropriate for particular people [22].

An important part of nutritional self-management in IBD is having access to appropriate dietary guidance [23]. However, rather than with the assistance of a health care provider, people typically discover their food tolerances and intolerances through observation and experimentation [18, 23]. This increases the danger of (micro)nutrient deficits when restrictive diets and food avoidance are followed. Furthermore, there is no certainty that the optimal approaches to bowel disease management are employed. However, there is proof that the efficiency of individual diets could be increased with the help of a qualified nutritional IBD service [23]. It's crucial to first understand the dietary patterns and attitudes that IBD patients currently hold. Consequently, The purpose of this study was to learn how IBD patient understands the role that nutrition plays in their bowel condition and the dietary actions they take to manage or prevent disease symptoms.

Subjects and methods

Data A self-administered questionnaire was formed of 30 questions assessing general characteristics, dietary beliefs, behaviors, nutritional knowledge, and sources of dietary advice. The questionnaire was developed after reviewing the literature on IBD patients' dietary habits, beliefs, therapies, and attitudes [15, 18, 20, 24]. Based on this literature study, relevant topics for the questionnaire were identified. Also, a Pilot study was done with the draft questionnaire, then it was thoroughly discussed with the IBD patient and modified because of practical aspects and face validity. The questionnaire included 30 close-ended questions, which were divided into 5 sub-domains:

1. General characteristics of the participants (age, sex, residency, occupation, special habits, IBD type, IBD site in the GIT, disease activity, type of medication, and if there were any complications)

2. Dietary beliefs

3. The source of the dietary advice.

4. Dietary behaviors and practices

5. Use of Egyptian oriental foods

Answer options were made as complete as possible to ensure that important factors were not missed. The questionnaire was constructed in such a way to take less than 30 min to fill out.

Inclusion criteria

All patients diagnosed to have Inflammatory bowel disease either Crohn's disease or Ulcerative Colitis -based on clinical data, lab investigations, endoscopy, and histopathology [25]- attending our Inflammatory bowel disease outpatient clinic at Al-Rajhy Liver Hospital, Assiut University for any reason, either in remission or in active disease state were included in the questionnaire in our study.

Exclusion criteria

Severe disease and critical patients in the Intensive Care Unit with severe exacerbation were excluded from the study. Patients who were not surely diagnosed to have IBD were excluded from the study. Patients were excluded if they had significant comorbidities, or if they were pregnant or lactating. Also, patients with any other acute illness and those who underwent gastrointestinal surgical interventions due to any cause were excluded from the study.

Statistical Analysis

The data will be entered and analyzed in IBM SPSS Statistics version 22 [26]. Descriptive statistics will provide a first insight into the data collected. Proportions for categorical variables will be expressed as percentages. The chi-square test of independence will be used to perform bivariate comparisons of nominal categorical variables, specifically to test differences across IBD type, gender, and disease duration between the groups that had the disease either less than 10 years or 10 years or more. $p < 0.05$ was considered statistically significant.

Ethical considerations

This research will follow the ethical standards established by the principles of the Ethical Committee in Assiut University Hospitals. Ethics approval is required. All patients were enrolled after signing a written informed consent.

Results

The Baseline characteristics

The current study involved one hundred Inflammatory bowel disease patients diagnosed based on laboratory investigations, Endoscopy, and histopathology to have either Crohn's disease (CD) or Ulcerative colitis (UC). About two-thirds of the patients were females and one-third were males. Age distribution ranged from (18-57) years old. Seventy-four patients (74%) were diagnosed with UC and (26%) with CD. Half of the patients had active disease and half were in remission, Most of them had colonic involvement. Approximately, half of them received conventional treatment in the form of Corticosteroids, 5-aminosalicylic acid derivatives (5-ASA); Mesalazine, and Azathioprine. The majority of the other biological group received Infliximab (IFX) as a biological therapy (Table 1-3).

Table 1. Baseline Socio-demographic characteristics of the studied group

Variable	Category	n = 100
Age in years	Mean \pm SD	34.01 \pm 9.6
	Median (Range)	13 (18 - 57)
Age Group	\leq 40 years	75 (75%)
	> 40 years	25 (25%)
Sex	Male	34 (34%)
	Female	66 (66%)
Residence	Asyut	86 (86%)
	Minya	4 (4%)
	Suhag	4 (4%)
	Aswan	2 (2%)
	Qena	2 (2%)
	Wadi	2 (2%)
Occupation	Housewife	60 (60%)
	Employer	20 (20%)
	Farmer	11 (11%)
	Student	9 (9%)
IBD Type	Crohn's Disease	26 (26%)
	Ulcerative Colitis	74 (74%)
Disease Activity based on Labs	Active	48 (48%)
	Remission	52 (52%)
IBD Site based on Endoscopy	Colonic	83 (83%)
	Small Intestine	16 (16%)
	Small & Large Intestine	1 (1%)
IBD Treatment	Conventional	44 (44%)
	Biological	56 (56%)
Type of Biological therapy	Infliximab	92 (92%)
	Ustekinumab	4 (4%)
	Adalimumab	4 (4%)

Table 2. Baseline Endoscopic and Laboratory findings of Active disease group

Variable	Category	n = 48
• ESR	• Mean ± SD	44.01 ± 9.6 mm/hr
	• Median (Range)	30 (18 - 120)
• CRP	• Mean ± SD	20 ± 5 mg/L
	• Median (Range)	23 (12 - 60)
• Endoscopy	• Proctitis	4 (8.3%)
	• Left-sided colitis	34 (70.8%)
	• Pan Colitis	6 (12.5%)
	• Ileitis	3 (6.25%)
	• Ileitis & colitis	1 (2.15%)

Table 3. Clinical Characteristics of the studied sample (B)

Variable	Category	n = 100
• IBD Duration/months	• Mean ± SD	33.08 ± 40.5
	• Median (Range)	24 (1 - 240)
• IBD Duration Category	• < 5 years	80 (80%)
	• ≥ 5 years	20 (20%)
• Complications	• No	91 (91%)
	• Type 2 DM	2 (2%)
	• HBV	2 (2%)
	• Iry Biliary Cirrhosis	1 (1.5%)
	• Extraintestinal Manifestations	4 (4%)

Table 4: Questions about patients' dietary beliefs among the studied sample

Question (n = 100)	Answer n (%)			
	Yes	No	Don't Know	
Do you believe that nutrition is the most important cause of your IBD?	68 (68%)	15 (15%)	17 (17%)	
Do you believe that nutrition plays an important role in causing relapse?	82 (82%)	9 (9%)	9 (9%)	
Do you believe that you can end a relapse faster with adapted nutrition?	86 (86%)	8 (8%)	6 (6%)	
Do you expect to gain more control over IBD through nutrition in the future?	86 (86%)	9 (9%)	5 (5%)	
Are you controlling your disease symptoms by adapted nutrition?	Never	Always	Only on Remission	
	35 (35%)	40 (40%)	25 (25%)	
What is the importance of nutrition compared to your medicine?	Equal	More Important	Less Important	
	46 (46%)	23 (23%)	31 (31%)	
What is your nutrition advice source?	Self-experience	Medical Advice	Internet	Other patients & General Population
	52 (52%)	40 (40%)	12 (12%)	6 (6%)

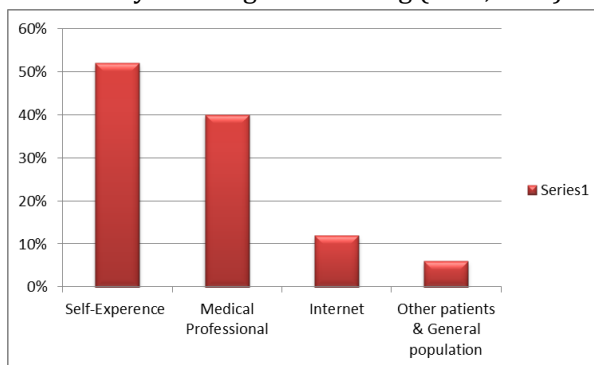
Dietary Beliefs

Most of the patients (68%) thought that nutrition was the most important cause of their IBD, the majority of the studied patients (82%) believed that nutrition plays an important role in causing relapse, and (86%) of them believed that a relapse could be ended faster by adapting their dietary intake. All these patients (86%) who believed in nutrition's role in controlling a relapse, believed also that they can gain more control over their IBD through nutrition in the future. (40%) of patients reported that they always control symptoms by adapting nutrition, (25%) only during relapse, and (35%) never tried to control symptoms by adapting nutrition. About one-quarter of patients (23%) believed that diet is more important than medications, (46%) believed it to be equal to medications, and (31%) believed that diet is less important than medical treatment (Table 4). More than half of the patients (52%) gained their nutritional advice through self-trials depending on their own experience, medical advice came second (40%), the Internet came third (12%), then lastly other patients and the general population (6 %) (Fig 1).

Dietary Behaviours

From the studied sample only (25%) reported following a specific diet for disease control, however (88%) omitted certain foods to reduce disease symptoms. Abdominal Pain, cramps, diarrhea, and vomiting were most often improved by omitting

certain foods (65%, 65%, 62%, 62%) respectively followed by bleeding and bloating (31%, 31%).

**Figure 1.** Source of Information about Nutrition with IBD

Others such as (distension/dyspepsia/mucous/undigested Food in stool) were less reported to be improved (14%). About (60%) reported eating more of certain foods (as shown in Table 6) that have a beneficial effect on disease symptoms, mainly; abdominal pain, diarrhea, bloating, and others such as (distension/dyspepsia/mucous/undigested Food in stool) (46%), (20%), (23%), and (8%) respectively. Regarding lifestyle modification behaviors; about (17%) of patients adapted to eating small frequent meals, (17%) adapted to regular meals, (11%) resorted to relaxation and enhancing physical activity, and (8%) avoided dinner and fast Foods (Table 5).

Table 5. Questions about the dietary behavior among the studied sample (A)

Question (n = 100)	Answer n (%)	
	Yes	No
• Have you followed a diet for your IBD?	25 (25%)	75 (75%)
• Do you omit foods to reduce disease symptoms?	88 (88%)	12 (12%)
• Disease symptoms are reduced by omitting foods		
✓ Abdominal Pain/Cramps	65 (65%)	35 (35%)
✓ Diarrhea/Vomiting	62 (62%)	38 (38%)
✓ Bleeding	31 (31%)	69 (69%)
✓ Bloating	31 (31%)	69 (69%)
✓ Others (Distension/Dyspepsia/Mucous/Undigested Food in stool)	14 (14%)	86 (86%)
• Do you eat more of certain foods that have a beneficial effect on disease symptoms?	60 (60%)	40 (40%)
• Disease symptoms that are improved by eating more of certain foods		
✓ Abdominal Pain/Cramps	46 (46%)	54 (54%)
✓ Diarrhea	20 (20%)	80 (80%)
✓ Bloating	23 (23%)	77 (77%)
✓ Others (Distension/Dyspepsia/Mucous in stool/Bleeding)	8 (8%)	92 (92%)
• Nutrition and lifestyle adaptations to reduce disease symptoms		
✓ Regular Meal	14 (14%)	86 (86%)
✓ Avoid Dinner/Fast Food	8 (8%)	92 (92%)
✓ Frequent Small Meal	17 (17%)	83 (83%)
✓ Relaxation/physical activity	11 (11%)	89 (89%)

Table 6. List of the most often avoided/more consumed foods reported by patients

Food Item	n (%)	Food Item	n (%)
Most Often Avoided		Most Often More Consumed	
• Spicy Food	57 (57%)	• Anise	34 (334%)
• Fatty/Oily Food	54 (54%)	• Tea	6 (6%)
• Peans/Falafel	15 (15%)	• Soap	14 (14%)
• Legumes	25 (25%)	• Mint	15 (15%)
• Pickles	11 (11%)	• Milk/Milky Products	8 (8%)
• Milk/Milky Products	51 (51%)	• Fenugreek	11 (11%)
• Carbonated Drinks	5 (5%)	• Boiled Veg./Eggs	14 (14%)
• Cabbage/Cauliflower	5 (5%)	• Caraway	6 (6%)
• Fruits	9 (9%)	• Latency	6 (6%)
• Tomato/Tomato Juice	6 (6%)	• Others	17 (17%)
• Kushari/Feseekh	6 (6%)	✓ Apple	3 (3%)
• Onion/Garlic	14 (14%)	✓ Ginger	2 (2%)
• Deep Fried Food	16 (16%)	✓ Rusk	2 (2%)
• Gluten (bread, pasta, candy)	6 (6%)	✓ Cucumber	1 (1%)
		✓ Cabbage	1 (1%)
		✓ Rucola	1 (1%)
		✓ Gravel Rink	1 (1%)
		✓ Chamomile	1 (1%)
		✓ Thyme	1 (1%)

Table 7: The Dietary Behavior among the studied sample (B)

Question (n = 100)	Answer n (%)	
	Yes	No
• Do you use food supplements?	19 (19%)	81 (81%)
• What supplements?		
✓ Iron	12 (12%)	88(88%)
✓ Multi-vitamin	8 (8%)	92 (92%)
✓ Calcium	2 (2%)	98 (98%)
✓ Vitamin B12	2 (2%)	98 (98%)
• Reason for Supplement Use		
✓ Improve sense of well being	12 (12%)	88(88%)
✓ Improve Symptoms of IBD	3 (3%)	97(97%)
✓ Reduce Fatigue	3(3%)	97(97%)
✓ Others	6 (6%)	94 (94%)
• Do you use foods enriched with probiotics?	54 (54%)	46 (46%)
• What probiotics?		
✓ Yogurt	45 (45%)	55(55%)
✓ Bran Bread	15 (15%)	85(85%)
✓ Oats	2 (2%)	98(98%)
• Oriental Food	74 (74%)	26 (26%)
✓ Beans	45 (45%)	55(55%)
✓ Falafel	46 (46%)	54(54%)
✓ Kushari	48 (48%)	52(52%)
✓ Feseekh	25 (25%)	75(75%)
✓ All	6 (6%)	94(94%)
• Symptoms related	57 (57%)	43 (43%)
✓ Abdominal Pain/Cramps	34 (34%)	66(66%)
✓ Diarrhea	40 (40%)	60(60%)
✓ Bloating	37 (37%)	63(63%)
✓ Others (Dyspepsia/ Bleeding)	14 (14%)	86(86%)
• Avoiding oriental foods	37 (37%)	63 (63%)
✓ Yes	34 (34%)	66(66%)
✓ Partially	2(2%)	98(98%)
✓ Trying	2 (2%)	98(98%)

From the studied sample we found that (19%) of patients used food supplements in the form of Iron (12%), Multivitamins (8%), Calcium, and Vitamin B12 (2%) (2%), respectively. About 12 % of them believed that these food supplements improve their sense of well-being, (3%) improve symptoms of their IBD, and (3%) to reduce fatigue. More than half of these patients (54%) reported their use of food enriched with pre-biotics and pro-biotics in the form of Yogurt (45%), Bran Bread (15%), and Oats (2%). Regarding Egyptian oriental foods, (74%) of patients reported intake of these foods such as Mashed Fava Beans (45%), Falafel (Fried ground fava beans with Garlic and spices) (46%), Kushari (a mixture of rice, pasta, lent, tomato sauce and onions) (48%), and Feseekh (salted fish) (25%). About (57%) of these patients reported the development of symptoms related to these oriental foods such as abdominal pain and cramps (34%), diarrhea (40%), bloating (37%), and others (dyspepsia, bleeding) (14%) as shown in Table 7.

Discussion

The current study showed relatively young patients corresponding to the fact that IBD is typically a disorder that starts and is usually worse at a younger age and becomes less severe if developed at an older age [13, 27]. Furthermore, about 3 quarters of the study population were females, this is similar to other studies that described the same fact [16, 28] however, UC occurs slightly more often in males than females and CD occurs only slightly more often in women than men [29]. Possible explanations may be that women are more willing to participate in these types of studies than men or that women are more interested in nutrition than men, or that males have little compliance with regular follow-up visits in outpatients clinic than women.

To our knowledge, the dietary beliefs and habits of the IBD population in Egypt have never been described before. This study included 100 patients diagnosed to have IBD in Assiut, Egypt. This study aimed to make a description of the perspectives of Egyptian IBD patients concerning their diet. About Sixty-eight percent (68%) of these patients believed that nutrition was the most important cause of their IBD, this is against what was reported in Zallot et al. 2012 study (France) [16] and in de Vries et al. 2019 study (Netherlands) [28].

Many patients were of the belief that nutrition had no direct impact on the onset of IBD. Decreased intake of fermented food products and overconsumption of processed sugar, dietary linoleic acid, and saturated fats have been suggested as major dietary etiological factors for IBD [30–33]. Scientific proof is still missing, though. In two studies, the effects of a modern diet were assessed. Cola drinks, chewing gum, eating chocolate, fast food, and coffee consumption all seemed to be linked to the development of CD, but they could not be recognised as actual risk factors [34, 35]. There is now no definitive hard proof that diet directly influences the genesis of IBD [23]. A majority of these patients (86%) believed in nutrition's role in causing a relapse or ending a relapse faster by adapting nutrition to improve symptoms, this came in concordance with other studies where patients believed that diet may influence the natural history of IBD by causing relapses or improving disease symptoms [16, 20, 28, 36]. All these patients (86%) who believed in nutrition's role in controlling a relapse, believed that manipulation of diet is a beneficial managing tool and can achieve more control over their IBD in the future. Strict nutrition adaptation is always achieved by about (40%), about (25%) of patients only during relapse, and (35%) never tried to adapt nutrition to control symptoms. This is much higher than the results of the Green et al. study in 1998 where only 10-40% of IBD patients succeeded strict nutritional adaptation [37]. However, Cohen et al. 2013 confirmed that patients in their study with IBD restricted their dietary patterns due to active symptoms or fear of exacerbating symptoms [38]. Triggs et al. 2010 showed that the majority of their subjects more than (66%) reported that specific changes to their diet permitted a decrease in either the severity of symptoms or in the number of inflammatory episodes, while other foods were either seen as neutral or potentially beneficial [20].

In this study, About Sixty-nine percent (69%) believed that diet is equal to or even more important than medications, these results are slightly higher than the de Vries et al. 2019 [28] study where about (60%) of patients thought so. This may be explained by the higher patients' interest and trust in nutrition's role as a beneficial tool for controlling the disease in our society.

About only one-quarter of patients reported following a specific dietary regimen, but these regimens were not under medical supervision, however, nearly half of our patients gained their dietary regimens from self-experience, other patients, the internet, and medical advice. Non-medical advice may be not only non-beneficial but also may be harmful. Richman et al. 2013 showed little evidence to support specific dietary recommendations. Nevertheless, people with IBD deserve good nutritional advice based on - what Richman et al. called - "the best available evidence" rather than no advice at all, although dietary intake should not be inappropriately restrictive. Further interventional studies of dietary manipulation are urgently required [39]. About three-quarters gained their nutritional advice through self-trials depending on their own experience (75%), Medical advice came second (20%) and Internet came third (5%). This matches other studies that showed that patients learn about their food tolerances and intolerances by trial and error [18, 23] rather than under the guidance of a health professional. This creates a high risk of (micro) nutrient deficiencies in case of uninformed or badly informed food avoidance and strict diets. Another study showed that almost (81%) of the patients stated that the main source of their nutrition knowledge related to their IBD was based on their own experience; the Internet came second, followed by the dietician and the treating medical specialist in the hospital (37.2, 25.3, and 23.9% respectively

The most frequently used dietary tools were omitting detrimental foods (88%), rather than consuming specific "helpful" foods (60%) or following special diets (25%). This suggests patients' preference not to consume more foods that are considered beneficial or follow strict diets, but rather exclude foods that may give problems. This was also found in a study done by Jowet et al. 2004 [30] on the UC population.

About (88%) of patients used to avoid some foods/beverages and eliminate them from their diet to achieve more control of their symptoms. In the Netherlands study in 2019, (76.5%) omitted foods in order to reduce disease symptoms [28], In France only (10-40 %) of patients avoided their own "harmful" foods. In Gloria et al. study that was conducted in Columbia, Canada, about (40%) of patients avoided foods [40]. This could be explained by the great passion and interest of Egyptian patients in nutrition adaptation.

The most often improved symptoms are abdominal Pain, cramps, diarrhea, and vomiting. The same as de Vries et al. 2019 described in their study; where abdominal pain and cramps were most often believed to be reduced followed by diarrhea, relapse, and fatigue [28].

Contrarily in the de Vries study 2019, they found that (56.7%) of the participants consumed certain foods more frequently if they expected a beneficial effect on their disease symptoms. Abdominal pain and cramps were thought to improve most often, followed by diarrhea, fatigue, and relapse [28]. This matches our results where about (60%) of our patients tended to do so.

The most commonly omitted foods in this study were: spicy foods (57%), fatty oily foods (54%), milk and milk products (51%), legumes (25%), Onions and Garlic (14%), and Gluten containing products (bread, rice, pasta) (6%). This partially matches the Netherlands study, where dutch IBD patients were; spicy foods were avoided by (74.7%) of the respondents, followed by strongly seasoned foods, carbonated drinks, milk, and other dairy products [28], These foods were found in other studies on IBD patients to cause food intolerances and deterioration of IBD symptoms and became most often avoided by patients [16, 24, 30, 38, 41]. This clarified why Egyptian oriental foods worsened disease symptoms. These Oriental foods were named: "Ful Medames" (Mashed Fava Beans), "Falafel" (Fried mashed Fava Beans with spices, onions, and garlic), "Kushari" (A mixture of rice, pasta, lentil, fried onions, and Tomato sauce, "Feseekh" (Salted raw Fish). About Three-quarters of patients reported eating these oriental Egyptian foods (Medames, Falafel, Kushari, and Feseekh). Fifty-seven percent (57%) reported symptoms worsening related to these foods, however only (37%) reported trials to avoid them.

This study showed that more than half of the patients (51%) tended to avoid milk, dairy, and lactose-containing products and states significant improvement. Past research confirmed that all foods that are associated with intolerances, may not exacerbate the disease process but simply lead to symptoms as they would in individuals without IBD so many studies described that IBD patients used to avoid milk and dairy products [36, 38, 42]. This was in line with Mishkin's study [43], which noted lactose malabsorption and intolerance to dairy products as crucial factors to take into account while managing IBD.

They proposed that there might be numerous different causes of dairy sensitivity. These may include an allergy to milk proteins, lactose intolerance or malabsorption, negative effects of milk's long-chain triacylglycerol abundance, etc. Since lactose malabsorption is influenced by variables other than lactase enzyme activity, such as bacterial overgrowth and/or small intestinal transit time, it appears to be more significant in CD patients with small intestine involvement than in CD patients with colonic involvement.

Compared to cow's milk, the likelihood that sheep and goat milk will exacerbate symptoms was lower. Even though soy milk frequently showed signs of being tolerated better than milk products, it should be remembered that this is not legally a dairy product [43].

The Gluten-containing diet also is accused to deteriorate IBD symptoms in our patients (6%), this matches other studies, Zallot et al. 2012 showed that (63.5%) of their patients reported avoiding a diet with gluten [16, 28]. These dietary restrictions could also be used to treat non-celiac gluten sensitivity, which is becoming more well recognised. Avoiding these meals is probably not dangerous and may even help with digestive issues [41]. According to a recent New Zealand study, the majority of CD patients accepted gluten-free diets well. This findings might be explained by the fact that these individuals' gastrointestinal problems may be driven on by other food types that are linked to gluten, such as fructans. The function of fructans and other fermentable oligo-, di-, and monosaccharides and polyols (FODMAPS) in the development of digestive problems is now amply supported by research [20].

Many studies describe that gluten products (such as whole white bread, rice, and pasta), and pit fruits (such as apples and pears) were on the list of the most commonly avoided foods [20, 29, 31, 34], however, in other studies, they were reported to be beneficial in improving symptoms and have been more frequently consumed [35].

It is not possible to determine from the study's design whether these foods actually aggravate intestinal inflammation or only cause a flare-up of symptoms. Moreover, meals that might induce gastrointestinal discomfort in people without IBD are the ones that should be avoided so much [30, 36, 38].

Prospective follow-up studies should investigate any causal relationship between foods and the IBD disease course.

Milk, milk products, pit fruits (such as apples and pears), and cabbages were both on the list of most avoided as well as in the list of more consumed beneficial foods. The same phenomenon was seen in the study by Triggs et al. 2010 [20] who found that the same foods that were harmful in some were beneficial in others, hinting that personalized diets might be most effective in IBD.

The most commonly consumed foods or herbs for symptom improvement were Anise, Mint, soap, boiled eggs, boiled vegetables, and fenugreek. Other studies matched our results partially in boiled vegetables. This matches other studies in the United Kingdom in 2010 and New Zealand in 2004 [20, 30, 38]. However, In the de Vries et al. study 2019 [28] patients consumed whole wheat bread, tea, leafy vegetables, fatty fish, poultry, exotic fruits (such as bananas and avocado), pit fruits (such as apples and pears), and soft fruits (such as strawberries and raspberries). According to de Varies et al., some of the meals that were reported to be healthy in our study created issues in other investigations, demonstrating the significant differences between studies. These included leafy vegetables, fatty fishes, whole wheat bread, and pit fruits. Since the other research were conducted in immigrants in the United States, the United Kingdom, and New Zealand, this raises the possibility that cultural factors have a role in dietary practises and beliefs.

Furthermore, adopting frequent small meals is the most commonly used way for controlling symptoms than other lifestyle modifications such as sports, exercise, avoiding dinner, and fast foods. The majority of patients were against the use of dietary supplements and they have had dietary advice concerning their bowel disorder. In our IBD population, a great majority stated that the main source of their nutritional knowledge was their own experience. Nearly Half of our patients used probiotics to improve symptoms.

In order to fully evaluate the findings of our study, a few strengths and weaknesses of the research need to be discussed. One strength of the research was the extensiveness of the questionnaire. In this way, a lot of information was gained and this enabled us to make a clear profile of IBD patients and their dietary beliefs, behavior, and knowledge. Many questions in the questionnaire had multiple response options to make answers as complete as possible and to ensure that important factors were not missed.

A possible weakness in our study was the small sample size however to date there is no available data about the true incidence rate of IBD in Egypt. Additionally, not all regions of Egypt and their eating customs are covered by this study. Another issue was that the questionnaire's internal consistency was only satisfactory and that it was only verified for the dietary beliefs items. However, despite the questionnaire having space for development, we still believe that it has produced a significant amount of useful nutritional data about IBD patients.

Only (19%) of patients in the study reported using food supplements; in the form of Iron, multivitamins, calcium, and vitamin B12. However, in other studies patients tended to consume more food supplements. In France, de Vries et al. [28] reported that more than (65%) of the IBD patients took dietary supplements mainly to improve their health, indicating some awareness of possible (micro) nutrient deficiencies. This might mean that we need to educate our patients about micronutrient deficiency. Numerous studies have demonstrated that IBD patients frequently experience malnutrition, vitamin, and micronutrient deficiencies, particularly when they are on a restricted diet [44]. In the age of biologics, a case-control study [45] assessed the dietary health of CD patients. The absence of milk and vegetables led to significantly decreased calcium and vitamin C, E, and K intake [45]. In the survey, only 36% of IBD patients believed that their dietary behavior can cause vitamin and nutritional deficiencies, indicating that they are not aware of such disease complications.

Conflict of Interest Statement: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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