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REVIEW

# Avoidant/Restrictive Food Intake Disorder in Adult Patients with Gastrointestinal Diseases: A Concept Analysis Using Evolutionary Approach

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**Background:** Avoidant/restrictive food intake disorder is a recently introduced concept, initially focused on non-adult populations, and encompasses multiple dimensions such as physiological and psychological aspects. Due to symptom overlap, food avoidance and related symptoms in patients with gastrointestinal diseases are often overlooked or rationalized. The confusion and unclear definitions of related concepts have hindered further research and exploration.

**Objective:** This study aims to clarify the concept of avoidant/restrictive food intake disorder in adults with gastrointestinal diseases and to enhance clinicians' awareness of this phenomenon.

**Design:** Rodgers' evolutionary concept analysis.

**Methods:** A systematic literature search targeting avoidant/restrictive food intake disorder in adult patients with gastrointestinal diseases was conducted using keywords and entry terms across seven databases, including PubMed, Web of Science, EBSCO, CINAHL, PsycINFO, EMBASE, and CNKI (up to September 28, 2024). A concept analysis framework was employed to identify the concept's attributes, antecedents, consequences, and other defining characteristics.

**Results:** A total of 22 articles were included. Four attributes of avoidant/restrictive food intake disorder in adult patients with gastrointestinal diseases were extracted and identified: exclusionary/selective diet status, non-body image-related, negative/fearful response, and mixed/independent motivation. Antecedents include gastrointestinal diseases and symptoms, traumatic events and experiences, dietary adversities history, and nutritional misconceptions. Consequences involved nutritional/psychological consequences, poor overall health, complex disease management, and reduced quality of life.

**Conclusion:** We found that avoidant/restrictive food intake disorder in the context of gastrointestinal diseases is a state of disordered eating characterized by food exclusion and selectivity, which may progress into a disorder when its impact on physical or psychological functioning exceeds adaptive threshold. This study clarifies the concept, and the findings provide a basis for developing assessment tools, guiding dietary management, and informing the implementation of targeted interventions in GI patients.

**Keywords:** concept analysis, avoidant/restrictive food intake disorder, adult, gastrointestinal diseases, eating disorders

## Introduction

Gastrointestinal (GI) diseases, including functional and inflammatory GI disorders, gastrointestinal tumors, among others, can complicate eating and significantly impact patients' daily dietary practices.[1] Many patients associate food with GI symptoms like nausea, bloating, constipation, and diarrhea.[2,3] They often try to alleviate discomfort through dietary adjustments, with common methods including the elimination of certain foods.[4] The practice of food avoidance is prevalent among individuals with GI diseases.[5] Granted, such self-imposed dietary adjustments often lack scientific validation and may increase the risk of disordered eating.[4] Studies have shown that the prevalence of disordered eating behaviors among patients with GI diseases can be as high as 44%, significantly higher than in healthy control groups.[3] Moreover, many patients attempt to manage their symptoms through self-directed food exclusion before seeking

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professional consultation from gastroenterologists.[2] However, these unguided dietary adjustments may lead to more complex eating issues and, in some cases, progress into clinical eating disorders.

Among various eating disorders, avoidant/restrictive food intake disorder (ARFID) is a relatively new diagnostic concept. It was first introduced in *the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), published by the American Psychiatric Association (APA) in 2013. ARFID is characterized by selective food avoidance and a significant reduction in food intake, which may lead to malnutrition and weight loss.[6] Although this condition typically begins in childhood,[7,8] research on ARFID in adult populations has increased in recent years as awareness of the disorder has grown. According to online eating disorder screening data from the National Eating Disorders Association (NEDA), among 50,082 adult respondents, 2378 (4.7%) screened positive for ARFID, with 47% expressing a willingness to seek treatment.[9] Studies[10] indicate that adults exhibiting ARFID symptoms frequently experience significant psychological distress, similar to individuals with other eating disorders, and often present with comorbid mental health conditions such as depression and anxiety, leading to a decline in quality of life. A nationwide study in Australia[11] further confirmed that individuals with ARFID symptoms exhibit significantly lower psychological health-related quality of life compared to those without such symptoms.

One of the core manifestations of ARFID is a significant fear of potential adverse consequences following eating, with gastrointestinal discomfort (such as abdominal pain, nausea, or vomiting) being a typical example of these negative outcomes.[6] This fear response centered around GI symptoms leads to a notable clinical overlap between ARFID and GI diseases.[1] Additionally, the symptom overlap between ARFID and GI diseases also includes early satiety, loss of appetite, and other similar symptoms.[1] As a result, ARFID patients tend to have a higher prevalence of GI diseases, with GI issues being among the most common comorbid conditions in this population.[12,13] Studies[12] have shown that 35.7% of adult patients receiving treatment for ARFID also suffer from GI diseases. Furthermore, individuals with ARFID are more likely to have a history of gastrointestinal problems.[8] The DSM-5-TR[7] also indicates that the history of GI diseases is associated with the characteristic eating and dietary behaviors observed in ARFID. It is clear that the coexistence of eating disorders and GI diseases is not coincidental, nor are they mutually exclusive diagnoses. In fact, disordered eating behaviors can precede the onset of GI symptoms, co-occur with them, or even exacerbate their severity.[4] Therefore, for ARFID patients, integrated management of both eating behaviors and gastrointestinal conditions is crucial.

Although the relationship between GI symptoms and avoidant eating behaviors has garnered academic attention, discrepancies in the definition of related concepts persist across multidisciplinary discussions. The Rodgers' evolutionary concept analysis method, proposed by American scholar Beth L. Rodgers,[14] emphasizes that concepts are dynamically evolving, and their meanings continuously develop in response to changes in the application context. This research approach is especially effective for evaluating the evolution of a concept's meaning and the differences in its inter-disciplinary applications, thereby clarifying its usage at the current stage of research.[15] The avoidant or restrictive eating behaviors adopted by patients in response to food-related gastrointestinal reactions may, to some extent, be misunderstood as adaptive responses to disease symptoms, rather than manifestations of ARFID. This clinical understanding may impact healthcare professionals' identification and assessment of potential abnormal eating behaviors, resulting in the neglect of the comprehensive management for patients with GI diseases. Since ARFID in the context of GI diseases is a multidimensional concept involving physiological, psychological, and behavioral factors, an integrated analysis of existing literature is necessary to clarify its definitional boundaries and guide further research. Current research faces two primary limitations. First, existing studies predominantly focus on children or general eating disorder populations, limiting insights into ARFID within adults with GI diseases. Second, the epidemiological characteristics and clinical manifestations of ARFID in this patient group remain insufficiently explored, creating a significant research gap in the field.

Therefore, this study employs Rodgers' evolutionary concept analysis method to systematically analyze the concept and characteristics of ARFID in the context of GI diseases. By clarifying the concept's definition and identifying its specific attributes (including antecedents and consequences) within the GI disease population, the aim is to enhance clinical recognition and increase healthcare providers' awareness of this phenomenon, thereby providing theoretical support for further diagnosis and treatment. The findings of this study help healthcare professionals better recognize potential eating disorders when diagnosing and treating GI diseases. And facilitates their prompt identification and

correction of abnormal eating behaviors, prevention of food avoidance from progressing into a diagnosable eating disorder, implementation of personalized interventions. This approach ultimately aims to achieve individualized medical goals that address both physical and mental health.

## Methods

The concept of ARFID in adult patients with gastrointestinal diseases is elucidated through Rodgers' evolutionary conceptual analysis,[14,15] which employs a systematic step-by-step inductive approach.[16] This methodology (Table 1) not only helps to clarify the current core conceptual attributes of ARFID but also reveals its evolutionary patterns in interdisciplinary research.

### Data Sources

Based on Rogers' evolutionary concept analysis method, after choosing the concept of interest and associated expressions, the next step is selecting an appropriate range (settings and samples). When collecting data for concept analysis, particular attention must be paid to identifying the basis and contextual foundations of the concept, especially in interdisciplinary contexts. Therefore, this study was conducted within the academic contexts of medicine, nursing, and psychology. We conducted searches in both English and Chinese databases using a combination of keywords and entry terms, including PubMed, Web of Science, EBSCO, CINAHL, PsycINFO, EMBASE, and CNKI, with a search timeframe from the inception of the databases to articles published by September 28, 2024. The search terms used were: "ARFID", "Food Neophobia", "Feeding and Eating Disorders", "Gastrointestinal Diseases", "Gastric Disease", "Adult" and "Humans". The example of the search strategy using PubMed is shown in Supplementary Material 1.

The inclusion criteria were as follows: (a) full text available; (b) study subjects were patients with gastrointestinal diseases; (c) the study was related to the concept's attributes, antecedents, consequences, and related terms, and connected to the topic; and (d) studies published in English or Chinese. The exclusion criteria were as follows: (a) gray literature; (b) texts published in non-peer-reviewed journals; (c) letters to the editor, study protocols; and (d) study subjects were not adults (<18 years old). Additionally, we manually searched the reference lists of the retrieved articles to identify potentially relevant studies for further inclusion.

Through database searches, we retrieved 144 relevant studies. Two researchers independently reviewed these studies. After removing duplicates, 79 studies remained. Studies involving children rather than adults were excluded based on title and abstract review (n=18). A full-text review was conducted for the remaining articles (n=61), and we also retrieved 5 additional articles from the reference lists of the searched studies. Ultimately, we excluded studies that presented results in abstract form (n=13), articles unrelated to the topic (n=4), and studies that did not focus on ARFID (n=27). A total of 62 studies were excluded, and 22 studies were included (the specific process is shown in Figure 1). The specific reasons for exclusion and related references can be found in Supplementary Material 2.

**Table 1** Rodgers' Evolutionary Conceptual Analysis

| Phases | Process |
|---|---|
| A. The initial phase | 1. Choosing the concept of interest and associated expressions |
| | 2. Selecting appropriate range (settings and samples) for relevant material |
| | 3. Collecting materials for concept analysis involves the following components:<br>• The basis and contextual fundamentals of concept (interdisciplinary, sociocultural)<br>• The attributes of concept (along with the concept's surrogate and related terms, references, antecedents and consequences) |
| | 4. Managing the data and identifying related items |
| B. The core analysis phase | 5. Analyzing the above data with reference to the concept attributes |
| | 6. Giving an example appropriate for the concept, if possible |
| C. The further analysis phase | 7. Interpreting the results, identifying implications, hypotheses and implications for further evolution of the concept |

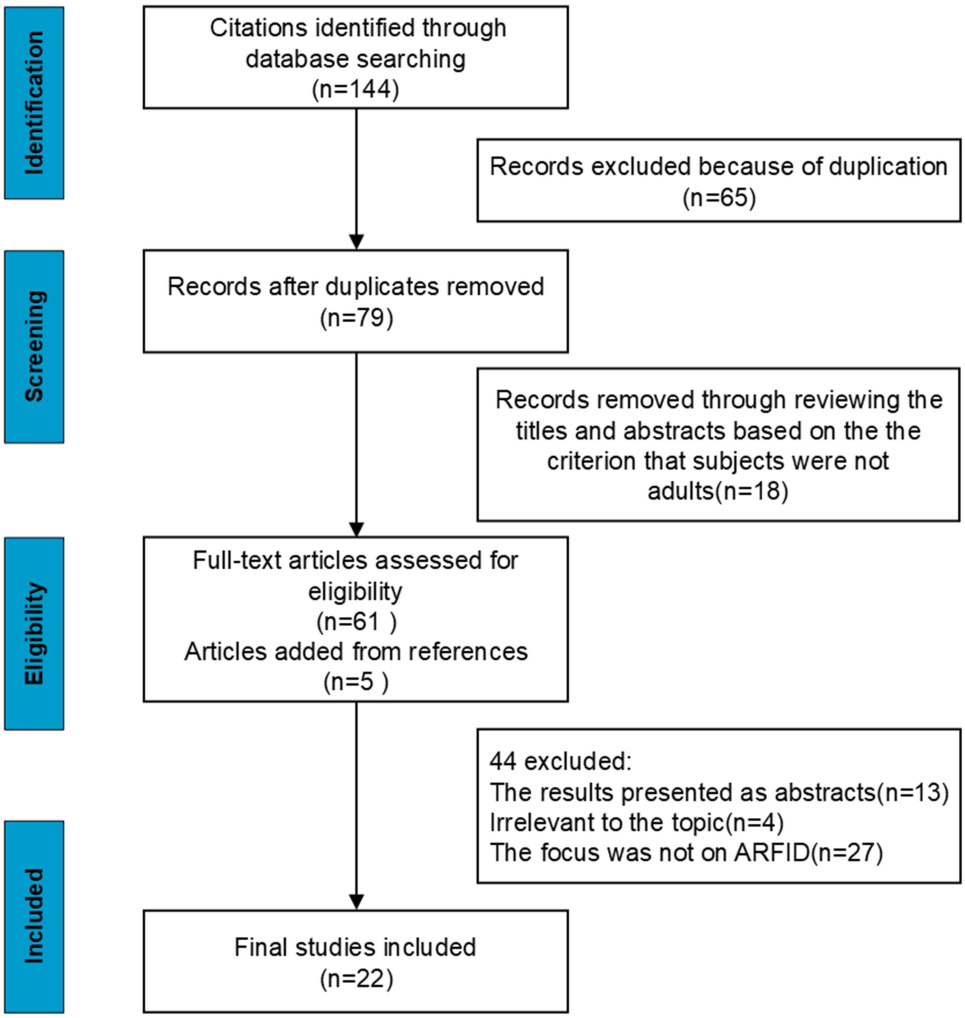


**Figure 1** Flow diagram for identification of studies for inclusion in concept analysis.

## Results

Through systematic literature search and selection, a total of 22 studies were included for literature analysis in this study. The basic characteristics of the included studies are summarized in Table 2. In terms of geographical distribution, 18 studies (81.8%) were conducted in the United States, with one study (4.5%) conducted in each of the following countries: Norway, Spain, Australia, and China. The study designs included 5 reviews, 2 case reports, 1 longitudinal study, 7 cross-sectional studies, 3 retrospective cohort studies, 2 retrospective chart reviews, and 2 prospective observational studies. All studies focused primarily on adult populations, with 4 studies (18.2%) also included participants from other age groups. Information on race or ethnicity was reported in 9 studies (40.9%), with White individuals being the most represented group. Regarding gender distribution, 15 studies (68.2%) reported that female participants constituted the majority. Data were extracted from the included studies using Rodgers' evolutionary concept analysis, with detailed results presented below.

### Development and Use of the Concept

The Oxford Dictionary defines the following terms as: "Avoidant" as an adjective, refers to a type of personality or behavior characterized by the avoidance of intimacy or social interaction. "Restrictive" which is also an adjective, refers to imposing restrictions on someone's activities or freedom. The term "disorder" when used as a mass noun, denotes a state of confusion, and when used as a count noun, it refers to an illness or condition that disrupts normal physical or

**Table 2** Characteristics of the Included Studies

| Author (Year)/Country | Study Design | Gastrointestinal Diseases Type | Race or Ethnicity | Sample Size | Age Range | Sex |
|---|---|---|---|---|---|---|
| Reas (2014)[17] Norway | Literature Review | EA | - | - | 9–44 | Female(97.2%) |
| Tsai (2017)[18] USA | Case Report | - | Caucasian | 1 | 56 | Male |
| Makhzoumi (2019)[19] USA | Part of a Longitudinal Study | • GERD<br>• GP<br>• IBS | - | 275 | 11–26 | • Female:236 (86%)<br>• Male:39 (14%) |
| Burton (2020)[20] USA | Cross-Sectional Study | GP | - | 288 | 17–78 | • Female:226 (78%)<br>• Male:62 (22%) |
| Murray (2020)[21] USA | Retrospective Cohort Study | DGBI | - | 410 | 18–90 | • Female:298 (73%)<br>• Male:112 (27%) |
| McGowan (2021)[4] USA | Review | IBS | - | | - | - |
| Nicholas (2021)[22] USA | Cross-Sectional Study | • Functional GI disorders<br>• Esophageal disorders<br>• Gastric disorders<br>• Malabsorption disorders<br>• Inflammatory disorders | • White:2314 (89%)<br>• Black:61 (2%)<br>• Asian:40 (2%)<br>• Native American:16 (1%)<br>• Pacific Islander:2 (0%)<br>• Hispanic:106 (4%)<br>• Other:66 (3%)<br>• Not Indicated:5 (0%) | 2610 | 18–44 | • Female:1921 (74%)<br>• Male:634 (24%)<br>• Not Indicated:55 (2%) |
| Yazdani (2022)[23] USA | Case Report | SMAS | - | 1 | 18 | Female |
| Molina-Infante (2022)[24] Spain | Review | EOE | - | - | - | - |
| Ketchem (2022)[25] USA | Retrospective Cohort Study | EOE | • White:8 (67%) | 12 | >18 | • Female:3 (25%)<br>• Male:9 (75%) |
| Murray (2022)[26] USA | Review | DGBI | - | - | - | - |
| Burton (2022)[27] USA | Cross-Sectional Study | DGBI | • White<br>• Asian/Pacific Islander<br>• Black/African American | 99 | 18–82 | Female(77.1%) |
| Yelencich (2022)[28] USA | Cross-Sectional Study | IBD | • White:114 (70.8%)<br>• Black:6 (3.7%)<br>• Asian:3 (1.9%)<br>• Other:38 (23.6%) | 161 | ≥18 | • Female:88 (54.7%)<br>• Male:73 (45.3%) |

(*Continued*)

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**Table 2** (Continued).

| Author (Year)/Country | Study Design | Gastrointestinal Diseases Type | Race or Ethnicity | Sample Size | Age Range | Sex |
|---|---|---|---|---|---|---|
| Fink (2022)[1] USA | Cross-Sectional Study | • EA<br>• CD<br>• EoE<br>• IBD | • White:255 (88.2%)<br>• Black/African:4 (1.4%)<br>• American Latino/a:6 (2.1%)<br>• Native Pacific Islander or Native American:1 (0.3%)<br>• Asian:3 (1.0%)<br>• Other:11 (3.8%)<br>• Did not say:9 (3.1%) | 289 | ≥18 | • Female:235 (81.3%)<br>• Male:41 (14.2%)<br>• Transgender:2 (0.7%)<br>• Other:2 (0.7%)<br>• Did not say:9 (3.1%) |
| Burton (2022)[29] USA | Review | • IBS<br>• IBD<br>• CD | - | - | - | - |
| Day (2022)[30] Australia | Prospective Multicentre Observational Study | IBD | - | 108 | ≥18 | • Female:61 (56%)<br>• Male:47 (44%) |
| Atkins (2023)[5] USA | Retrospective Chart Review | DGBI | • American Indian or Alaskan Native:2 (0.4%)<br>• Asian:21 (4.2%)<br>• Black or African American:19 (3.8%)<br>• Native Hawaiian or Pacific Islander:0 (0.0%)<br>• White:414 (83.6%)<br>• Other/Unknown:39 (7.9%) | 495 | 6–90 | • Female:342 (69%)<br>• Male:153 (31%) |
| Burton (2023)[31] USA | Prospective Observational Study | DGBI | White | 14 | ≥18 | • Female:10 (71%)<br>• Male:4 (29%) |
| Nitsch (2023)[13] USA | Retrospective Chart Review | DGBI | • White or Caucasian:110 (90%)<br>• Asian:1 (1%)<br>• Other:3 (2%)<br>• Decline to answer:1 (1%)<br>• Unknown:7 (6%) | 122 | 18–65 | • Female:84 (69%)<br>• Male:35 (29%)<br>• Nonbinary:2 (2%)<br>• M to F transgender:1 (1%) |
| Hollis (2024)[32] USA | Cross-Sectional Study | GP | - | 107 | ≥18 | • Female:90 (84.1%)<br>• Male:17 (15.9%) |
| Almeida (2024)[33] USA | Retrospective Cohort Study | • Structural GI Diagnoses<br>• Functional/Motility GI Diagnoses<br>• Unclassified | - | 344 | ≥18 | • Female:316 (91.9%)<br>• Male:28 (8.1%) |
| Yin (2024)[34] China | Cross-Sectional Study | IBD | - | 429 | 18–90 | • Female:151 (35.2%)<br>• Male:278 (64.8%) |

**Abbreviations**: EA, Esophageal Achalasia; GERD, Gastroesophageal reflux disease; GP, Gastroparesis; IBS, Irritable Bowel Syndrome; DGBI, Disorders of Gut-Brain Interaction; GI, Gastrointestinal; SMAS, Superior Mesenteric Artery Syndrome; EoE, Eosinophilic Esophagitis; IBD, Inflammatory Bowel Disease; CD, Celiac Disease; GP, Gastroparesis.

mental functions, such as eating disorders. In the studies included, most scholars classify ARFID as a disease diagnosis often comorbid with gastrointestinal diseases. And some scholars[29] argue that it is a spectrum, representing a state that can disrupt normal physical or mental functions. Based on the above, we contend that avoidant/restrictive food intake disorder is a state of disordered food intake characterized by exclusion and selectivity. When the negative impact on physical or mental functions exceeds the adaptive threshold, it can develop into a disorder.

Avoidant/Restrictive Food Intake Disorder (ARFID) was first introduced in *the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders* (DSM-5),[6] published by the American Psychiatric Association (APA) in 2013. It is characterized by a persistent failure to meet appropriate nutritional or energy needs. This concept replaced and expanded upon the DSM-IV diagnosis of Feeding Disorder of infancy or early childhood by removing age restrictions, thereby extending its applicability across the entire lifespan. Although ARFID is more commonly observed in children, it can also occur in older children, adolescents, and adults.[6] ARFID is commonly associated with weight loss, nutritional deficiencies, dependence on nutritional supplements, or psychosocial harm. Notably, psychosocial impairment, which is most commonly observed in adults,[35] was newly and formally incorporated into the DSM-5 as part of the section on functional impairment.[6,35] In 2022, the DSM-5-TR[7] further refined the diagnostic criteria for ARFID, clarifying that the disorder can occur at any age, not just in childhood, and may present for the first time during adulthood. With respect to gastrointestinal comorbidities, the DSM-5-TR retained the association described in DSM-5, noting that a history of gastrointestinal diseases and other medical conditions may be related to feeding and eating behaviors characteristic of ARFID. And particular attention is recommended for appetite reduction in older adults, individuals recovering from surgery, and patients undergoing chemotherapy. Currently, the ICD-11 also classifies ARFID under Feeding or Eating Disorders, defining it as a disorder characterized by avoidant or restrictive food intake that leads to nutritional deficiency or social impairment.[36]

In summary, ARFID has been recognized as a condition that can emerge in early childhood and persist across the lifespan, affecting individuals at various stages of adulthood,[7] and may also occur at any stage of life and affect individuals.[35] The evolution of this concept reflects a growing clinical understanding of ARFID in adult populations and highlights the need for researchers to investigate the disorders' specific manifestations under different medical conditions. However, as ARFID was originally conceptualized within a non-adult context, research has predominantly focused on pediatric and adolescent populations, while studies involving adults remain in the early stages.[12] A growing number of scholars are focusing on ARFID in adult patients with GI diseases. Current studies have conducted in the following areas: Irritable Bowel Syndrome(IBS),[4,21,27] Superior Mesenteric Artery Syndrome(SMAS),[23] Disorders of Gut-Brain Interaction(DGBI),[5,26,27,31] Inflammatory Bowel Disease(IBD),[28,34] Esophageal Achalasia(EA),[17] Gastroparesis(GP),[20,21,32] Celiac Disease(CD),[4] Eosinophilic Esophagitis(EoE),[24] Functional Dyspepsia(FD),[21,27] and other related conditions. In China, research on ARFID in adults has been limited to patients with IBD.[34]

## Attributes

Attributes are clusters of characteristics that define the core features of a concept.[14] Clearly identifying the attributes helps distinguish the concept from others. The avoidance/restrictive food intake disorder in adults with gastrointestinal diseases is multifaceted, with the following four attributes identified.

### Exclusionary/Selective Diet Status

Patients with GI diseases often exhibit excessive dietary restrictions,[4,27,34] which largely reflect the characteristics of avoidance/restrictive food intake disorders. This self-directed elimination of foods,[1,5,26,27,31,34] without guidance from healthcare providers, is manifested in reduced food intake, frequency, and variety.[1,5,20,22,26,29] Some patients may also exhibit dietary behavior patterns characterized by being "picky", "choosy", or "selective eating".[17,28]

### Non-Body Image-Related

ARFID is characterized by the absence of body image disturbance, an attribute that distinctly differentiates it from Anorexia Nervosa (AN) and Bulimia Nervosa (BN), both of which are fundamentally driven by pathological body image concerns.[4,5,18,21,23,27,29,32,33] In the context of GI diseases, individuals with ARFID may present with a wide range of

body weight statuses, including normal BMI, elevated BMI (25–29.9), or low BMI (<18.5).[4,20,21,27,32] However, their perception of body image remains undistorted. Some patients not only exhibit no anxiety regarding weight gain but may even express a clear desire to gain weight.[18] Nevertheless, their current dietary intake remains insufficient to meet their nutritional or energy requirements.[1,4,18,19,21,23,25,34] It is important to note that while adult patients with GI diseases may have comorbid eating disorders associated with body image disturbances, the uniquely non-body image-related nature of ARFID serves as an important indicator in the differential diagnosis of eating disorders.

### Negative/Fearful Response

The avoidant/restrictive food intake disorder in adults with gastrointestinal diseases is essentially a maladaptive behavioral response,[17,22,24,26,28,34] or a conditioned negative and fearful response, primarily manifested in emotional and psychological aspects.[5,13,18,22,24,25] Due to GI symptoms and discomfort caused by the disease, these patients are more likely to experience anxiety about the relationship between eating and symptom occurrence, and this may even evolve into a fear of the consequences of eating. The response exists along a spectrum[29] and vary across individuals — some patients with gastrointestinal diseases are able to adapt well, while others struggle to do so.

### Mixed/Independent Motivation

In *the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders* (DSM-5),[6] the motivations for avoidant/restrictive food intake disorder include (a) avoidance of food due to sensory concerns(SC), (b) lack of interest in eating/food(LOI), and (c) fear of adverse consequences (FOAC). For adult patients with gastrointestinal diseases, these three prototypical motivations can occur independently or in combination.[21,22,29,31] The most common motivation is the fear of the aversive consequences of eating a particular food, followed by lack of interest or low appetite. Sensory sensitivity to food characteristics is the least common motivation.[22,27,28,31]

## Antecedents

Antecedents refer to events or phenomena that occurred previously and are related to the concept.[15] The antecedents of ARFID in individuals with gastrointestinal diseases include:

### Gastrointestinal Diseases and Symptoms

ARFID in patients with gastrointestinal diseases are largely driven by the presence of GI diseases, symptoms, and the history of GI diseases and symptoms and also influenced by the type of disease and its activity level.[34] Patients may avoid or restrict the intake of certain foods during disease management to adapt to their disease status. Patients with GI-related diagnoses often experience recurring symptoms such as abdominal pain, bloating, constipation, indigestion, nausea, and vomiting,[1,20,34] sometimes even manifesting a combination of two or more.[13,22] These active gastrointestinal symptoms increase patients' heightened vigilance toward their GI symptoms and food intake,[28,29] resulting in marked food avoidance and restriction, which further leads to altered and disordered eating behaviors. The DSM-5 also notes that the history of gastrointestinal diseases, malignancies, vomiting, and other related issues are strongly associated with restrictive eating behaviors.[6] Existing studies have confirmed that gastrointestinal diseases such as IBS,[4,21,27] IBD,[28,34] and DGBI[5,26,27,31] are antecedents of ARFID.

### Traumatic Events and Experiences

Traumatic events that contribute to the development of ARFID in adults with gastrointestinal diseases mainly include life events or trauma and negative eating experiences.

#### Life Events or Trauma

Existing research indicates that life events or trauma can directly trigger ARFID in adults with GI diseases.[13,21,34] Invasive surgery, as a major trauma, often involves the gastrointestinal tract or repeated vomiting.[13] Therefore, it is an important factor contributing to ARFID in these patients.[13,21,34] Post-surgical GI patients commonly experience abdominal pain, bloating, and loss of appetite,[6] which may lead to the emergence of selective eating patterns. Yin's study[34] also supports the notion that surgery and post-operative eating can contribute to selective and avoidant eating disorders in

adults with GI diseases. Additionally, Nitsch's research[13] highlights that life events such as death, divorce, relationship conflicts, and sexual assault may also contribute to the onset of ARFID in adults. Non-GI diseases, musculoskeletal disorders,[29] and cardiac system diseases[13] are also identified as predictors for ARFID in patients with GI diseases.

### Negative Eating Experiences

Negative eating experiences refer to uncomfortable or painful outcomes or past experiences caused by GI diseases or symptoms, such as a history of vomiting or choking,[13] constipation or diarrhea,[4,31] and related pain.[19,21] These experiences also include the anxiety or worry associated with such aversive events.[22,30] In Atkins' study,[5] concern and fear related to GI symptoms (eg, the fear that eating might lead to discomfort or pain) were identified as precursors for ARFID signs. Ketchem[25] suggests that prior experiences with food impaction or severe swallowing difficulties can also cause ARFID behaviors and lead to more serious subsequent injuries or adverse outcomes. Reas[17] noted that achalasia, as a prototypical esophageal motility disorder within the spectrum of GI diseases, is frequently associated with restrictive eating and food avoidance behaviors. These behaviors are primarily attributable to changes in eating patterns induced by dysphagia and related pain.

### Dietary Adversities History

Studies have shown that most adults with gastrointestinal diseases are currently undergoing or have previously experienced restrictive diets,[5,21,27,33] including, but not limited to, dietary prescriptions for GI-related conditions or diet-controlled illnesses,[4] such as dietary approaches for DGBI or IBS.[26] Several studies have begun to explore the relationship between a history of dietary restrictions and the manifestation of ARFID.[4] Burton's study suggests a significant correlation between the history of selective diets in DGBI patients and the manifestation of ARFID symptoms.[31] Additionally, Fink's research[1] highlights that the origins of ARFID signs may also include following controlled diets and consultations with nutritionists.

### Nutritional Misconceptions

In addition to the aforementioned factors, misconceptions about diet and nutrition represent another important contributing factor to ARFID in adults with GI diseases. These patients often lack nutritional knowledge or literacy, and their attitudes and beliefs about nutrition are often incorrect. Yin's study[34] emphasizes that many Chinese patients, influenced by traditional dietary culture, believe that certain foods, referred to as "stimulating food", can exacerbate or precipitate a relapse of their illness, leading them to selectively exclude such foods. Furthermore, patients often associate their symptoms with specific foods, developing the belief that certain foods cause their illness.[33] Without professional dietary guidance, individuals may adopt self-initiated food avoidance behaviors,[5] which could potentially increase the risk of developing ARFID. Therefore, it is essential to strengthen dietary guidance and nutrition education for patients with gastrointestinal diseases to reduce nutritional misconceptions as much as possible.

## Consequences

Consequences describe the situations that follow the occurrence of a concept.[15,16] According to the included studies, the consequences of ARFID in patients with gastrointestinal diseases primarily include the following four types, and the results extracted from the literature are listed in Table 3, along with the attributes and antecedents.

### Nutritional/Psychological Consequences

The nutritional consequences of ARFID in patients with gastrointestinal diseases mainly refer to outcomes such as significant weight loss or failure to gain weight due to insufficient nutrition or energy intake, as well as varying degrees of malnutrition.[5,18,24,26,29,30,33,34] More severe manifestations include dependency on enteral feeding or oral nutritional supplements,[1,20,21,26,28] although this phenomenon does not necessarily occur. Psychological consequences include psychological distress and/or disorders. A decline in overall well-being,[30] mood disturbances,[1,25] anxiety, depression,[1,17,18,32–34] insomnia,[18] stress, or fatigue[1,30] may further progress to a range of psychosocial disorders, including social impairments, social isolation,[20,22,27] and learning or motor difficulties.[17,24]

**Table 3** Summary of Antecedents, Attributes, and Consequences of ARFID in Adult Patients with GI Diseases

| Author (Year)/Country | Antecedents | Attributes | Consequences |
|---|---|---|---|
| Reas (2014)[17] Norway | GI symptoms, negative eating experiences | Negative/fearful response, mixed/independent motivation | Psychological consequences |
| Tsai (2017)[18] USA | GI symptoms, negative eating experiences, chronic gastrointestinal disease | Failure to meet nutritional and/or energy needs, negative/fearful response, non-body image-related, mixed/independent motivation | Nutritional/psychological consequences |
| Makhzoumi (2019)[19] USA | GI symptomatology, negative eating experiences | - | Other health-related consequences, poor overall health |
| Burton (2020)[20] USA | GP, negative eating experiences | Negative/fearful response, mixed/independent motivation | Other health-related consequences, poor overall health, gastrointestinal medical outcomes, nutritional/psychological consequences, complex disease management |
| Murray (2020)[21] USA | Gastrointestinal symptoms, GP, IBS, multiple gastrointestinal diagnoses across systems, negative eating experiences, stomach complaints, the invasive surgery | Failure to meet nutritional and/or energy needs, non-body image-related, mixed/independent motivation, negative/fearful response | Nutritional/psychological consequences |
| McGowan (2021)[4] USA | GI symptom, GI diseases, IBS, CD, diet-controlled illnesses, negative eating experiences | Exclusionary/selective diet status, negative/fearful response, non-body image-related, failure to meet nutritional and/or energy needs | Gastrointestinal medical outcomes |
| Nicholas (2021)[22] USA | GI symptoms and disorders, negative eating experiences, anxiety and disgust | Exclusionary/selective diet status, mixed/independent motivation | Gastrointestinal medical outcomes, complex disease management, psychological consequences, poor overall health |
| Yazdani (2022)[23] USA | SMAS, anxiety disorders and depressive disorders, negative eating experiences | Failure to meet nutritional and/or energy needs, non-body image-related, negative/fearful response | Nutritional/psychological consequences, gastrointestinal medical outcomes, other health-related consequences |
| Molina-Infante (2022)[24] Spain | EoE, negative eating experiences | Negative/fearful response | Nutritional/psychological consequences, poor overall health |
| Ketchem (2022)[25] USA | Negative eating experiences | Failure to meet nutritional and/or energy needs | Psychological consequences |
| Murray (2022)[26] USA | DGBI, negative eating experiences, diet approaches for DGBI, dietary prescriptions for IBS | Exclusionary/selective diet status, negative/fearful response, failure to meet nutritional and/or energy needs | Nutritional/psychological consequences, gastrointestinal medical outcomes, other health-related consequences, reduced quality of life, complex disease management |
| Burton (2022)[27] USA | DGBI, IBS, dietary adversities history | Non-body image-related, exclusionary/selective diet status, failure to meet nutritional and/or energy needs, negative/fearful response, mixed/independent motivation | Nutritional/psychological consequences, poor overall health, reduced quality of life |
| Yelencich (2022)[28] USA | Intestinal inflammation, active gastrointestinal symptoms | Negative/fearful response | Nutritional/psychological consequences, poor overall health, reduced quality of life, gastrointestinal medical outcomes |
| Fink (2022)[1] USA | Following a diet, having met with a dietitian, worsening of symptoms, an increase in GI symptoms | Failure to meet nutritional and/or energy needs, mixed/independent motivation, exclusionary/selective diet status | Nutritional/psychological consequences, poor overall health, reduced quality of life, gastrointestinal medical outcomes, other health-related consequences |
| Burton (2022)[29] USA | GI disorder, GI symptoms, dysmotility | Non-body image-related, mixed/independent motivation, exclusionary/selective diet status, negative/fearful response, failure to meet nutritional and/or energy needs | Nutritional/psychological consequences, gastrointestinal medical outcomes, reduced quality of life, other health-related consequences, poor overall health |

(*Continued*)

**Table 3** (Continued).

| Author (Year)/Country | Antecedents | Attributes | Consequences |
|---|---|---|---|
| Day (2022)[30] Australia | Negative eating experiences | - | Nutritional/psychological consequences, reduced quality of life, fatigue, overall health, other health-related consequences, poor complex disease management |
| Atkins (2023)[5] USA | DGBI, stomach- related complaints dietary adversities history, dietary therapy, negative eating experiences | Non-body image-related, exclusionary/ selective diet status, negative/fearful response, mixed/independent motivation | Reduced quality of life, nutritional/ psychological consequences, gastrointestinal medical outcomes, other health-related consequences |
| Burton (2023)[31] USA | DGBI, dietary adversities history | Exclusionary/selective diet status, failure to meet nutritional and/or energy needs, mixed/independent motivation | Nutritional/psychological consequences, gastrointestinal medical outcomes, reduced quality of life, poor overall health |
| Nitsch (2023)[13] USA | GI symptoms, GI diagnoses/complaints, abdominal surgery, life event, trauma, disorders of the cardiac system | - | - |
| Hollis (2024)[32] USA | The Gp diagnosis, eating difficulties | Non-body image-related, negative/fearful response, exclusionary/selective diet status, | Nutritional/psychological consequences, gastrointestinal medical outcomes |
| Almeida (2024)[33] USA | GI symptoms, chronic gastrointestinal disease, dietary adversities history | Non-body image-related, mixed/ independent motivation, negative/fearful response | Gastrointestinal medical outcomes, nutritional/psychological consequences, other health-related consequences |
| Yin (2024)[34] China | IBD, gastrointestinal diseases and symptoms, nutritional misconceptions, postoperative diet, life events or trauma | Exclusionary/selective diet status, failure to meet nutritional and/or energy needs, negative/fearful response | Nutritional/psychological consequences, reduced quality of life |

**Abbreviations**: GI, Gastrointestinal; GP, Gastroparesis; IBS, Irritable Bowel Syndrome; CD, Celiac Disease; SMAS, Superior Mesenteric Artery Syndrome; EoE, Eosinophilic Esophagitis; DGBI, Disorders of Gut-Brain Interaction; IBD, Inflammatory Bowel Disease.

## Poor Overall Health

The poor overall health status of gastrointestinal diseases patients caused by ARFID is manifested in changes to gastrointestinal medical outcomes and other health-related consequences. Gastrointestinal medical outcomes primarily involve the persistence and worsening of gastrointestinal symptoms or functional problems.[29] Studies have shown that ARFID can lead to gastrointestinal diseases,[33] a finding consistent with the research of Atkins[33] and Burton,[31] who noted that ARFID exacerbates symptoms of DGBI. Studies have proposed that the development of ARFID in patients with GI diseases may also be mediated by two key mechanisms: visceral hypersensitivity and dysregulation of appetite-related hormones.[29] These mechanisms can lead to gastrointestinal dysmotility, including but not limited to impaired gastric accommodation and reduced gastric compliance. As well as sensory disturbances (for example, exaggerated responses to normal stimuli such as food digestion and intestinal peristalsis). Collectively, these alterations may further compromise GI function.[22,26,29] Additionally, ARFID in these patients may trigger secondary health issues,[1,28] such as its association with cardiovascular and neurological problems.[23] The physical deterioration caused by GI medical outcomes often signifies other health risks, which negatively affect the overall health of gastrointestinal patients and complicate clinical outcomes.[1,26,31] For instance, Yelencich's study[28] found that ARFID in gastrointestinal patients leads to longer hospitalization and increased mortality risk. Other studies also indicate that complications resulting from ARFID can be life-threatening,[1,29] including disability or death.[19,30] For gastrointestinal patients undergoing surgery, the occurrence of ARFID often leads to poorer surgical outcomes and impaired recovery, contributing to a deterioration in overall health.[30]

## Complex Disease Management

The occurrence of avoidant/restrictive food intake disorder (ARFID) in gastrointestinal patients significantly increases the complexity of disease management.[22] Typically, the treatment of GI diseases focuses on alleviating symptoms and restoring gastrointestinal function. However, the onset of ARFID expands the management objectives beyond the GI disease itself, requiring attention to the patient's nutritional status, mental health, and any other health issues that may

arise as a result. Consequently, for gastrointestinal patients who develop ARFID, disease management transitions from a focus solely on physiological symptoms to a multidimensional and comprehensive approach. This means that, in addition to addressing the gastrointestinal condition, management must also include nutritional interventions, psychological support, and the prevention and treatment of secondary diseases.[4,31]

### Reduced Quality of Life

Restrictive eating not only affects the health and management of patients with GI diseases but also significantly reduces their quality of life.[5,26,28,29,31,34] In a study involving 289 adults over the age of 18 with digestive system diseases, patients exhibiting ARFID symptoms reported lower health-related quality of life (HRQoL), indicating a close association between food avoidance and a decline in HRQoL.[1] Additionally, Day's multicenter cross-sectional study[30] of adult patients with IBD found that restrictive eating behaviors were significantly correlated with food-related quality of life (appetite dimension: $p = 0.030$; fear of eating dimension: $p < 0.0001$). Patients with IBD who exhibited restrictive eating behaviors had poorer food-related quality of life (FRQoL). In conclusion, the occurrence of avoidant/restrictive food intake disorder presents a dual challenge to the health and quality of life of GI patients.

## Related Concept

In the MeSH tree structures, the parent term for ARFID is "Feeding and Eating Disorders", while the entry term is "Food Neophobia". Several studies included in this research have regarded "Eating Disorders (ED)",[18,23,24,33,34] "feeding/eating disorders (FEDs)"[20] and "eating disorders not otherwise specified (EDNOS)"[18,23] as related or alternative terms for ARFID. Yazdani[23] and Murray[26] propose that "maladaptive eating behaviors" and "disordered eating behavior" are conceptually similar to ARFID. McGowan[4] recommends discussing the distinction between eating disorders and disordered eating in patients with gastrointestinal diseases, emphasizing the need to delineate the boundaries between these two concepts.

## Model Case

The model case is an application example that systematically presents all defining attributes of the concept. Its primary function is to illustrate the conceptual meaning within a specific context, thereby assisting clinical practitioners in more accurately identifying and applying the concept.[14,15] Model cases can originate from various sources, including real-life clinical practice, previously reported cases in the literature, or researcher-constructed scenarios tailored to the objectives of a study.[16] Based on the findings of this research, we constructed a hypothetical model case to elucidate the concept of ARFID in adult patients with GI diseases.

Mr. Wang, a 63-year-old man with a height of 170 cm and a weight of 62 kg (BMI: 21.5), underwent a radical subtotal gastrectomy 82 days ago due to gastric cancer. Upon discharge, his weight was 68 kg. He has now returned for his second postoperative follow-up.

Mr. Wang does not exhibit any body image disturbances. He stated,

> I think my current weight is relatively normal, but it has decreased significantly compared to before, and it seems to be continuously declining.

When asked if he was experiencing any gastrointestinal symptoms such as vomiting, diarrhea, bloating, or abdominal pain, he replied,

> I had these symptoms about a month after the surgery, but gradually went away and now it seems completely gone. But I'm still scared. What if these symptoms come back?

During the conversation, it became evident that his diet remains highly restricted. Mr. Wang's daughter complained,

> He is very selective about his food. Although his condition has improved significantly since the early postoperative period, we are encouraging him to try a broader range of foods, such as meats and fruits. But he consistently refuses, expressing concern that these foods may cause discomfort.

Mr. Wang believes that, despite significant improvement in his condition and the absence of disease progression, he can only eat foods he considers "safe", and only in very small portions. He said,

> People say I shouldn't eat chicken or beef. There was a liver cancer patient in our community who ate chicken, and his condition got worse. Also, I can't eat regular eggs, only goose eggs. So, I'm afraid to eat those foods. I only eat rice, noodles, some vegetables, and a little bit of pork.

Despite his concern about his slow weight gain, he is also afraid of eating more. His current consumption is insufficient to meet his body's energy needs. He expressed,

> Why can't I gain weight? My sleep has been bad recently, and sometimes when I lie in bed, I can't help think about my condition. I don't feel like eating this or that. When will it end?

## Measurement Tools

Measurement tools are tools that define the characteristics of the concept.[16] Among the studies included, the most commonly used measurement tool for ARFID is the self-report scale NIAS (Nine Item Avoidant/Restrictive Food Intake Disorder Screen), developed by Zickgraf[37] for assessing potential ARFID risk in individuals aged 18–65. The scale comprises three dimensions: picky eating, appetite, and fear-related eating behaviors, with a total of 9 items. It employs a Likert 6-point scale (ranging from "Strongly Disagree" = 0 to "Strongly Agree" =5), with a total score ranging from 0 to 45.

In the samples assessed using NIAS, the main variation lies in the choice of threshold for identifying ARFID. Some scholars use the total score of the scale to identify ARFID, with higher scores indicating greater levels of problematic eating behaviors across all dimensions.[31] Diagnostic thresholds of 24[28] or 28[34] are often used for identifying individuals at risk of ARFID. Other studies use individual subscale thresholds for screening. For instance, Burton[20] classifies gastroparesis patients who meet the critical threshold (≥12) on any subscale as "possible ARFID", while those who score ≥12 on any subscale and exhibit one or more medical or psychosocial impairments are classified as having "definite ARFID". Hollis,[32] based on DSM-5 ARFID diagnostic criteria, considers individuals to have ARFID if they meet at least one subscale threshold (picky eating or fear of negative consequences ≥10, appetite ≥9) and have one or more medical or psychosocial impairments. Additionally, some studies use either the total score or any individual subscale score to identify ARFID. Fink[1] suggests that using subscale scores may be valuable for assessing ARFID in gastroenterology samples, and in this study, ARFID is diagnosed if the total score exceeds 23 or if any subscale score exceeds 12. In addition to the NIAS, several other self-report tools for ARFID screening were identified in the literature included in this study. These tools include the ARFID Canadian Paediatric Surveillance Program Questionnaire used in combination with the EDE-Q,[27] as well as online ARFID screening questionnaires.[22] Interview-based self-report measures, such as the EAT-26[18] and the PARDI-AR-Q,[31] have also been utilized. However, to date, no gold-standard assessment tool for ARFID has been established within the context of GI diseases.

## Interventions

Treatment options for adults with ARFID are diverse, including psychotherapy,[12,38] nutritional management,[19] the use of psychiatric medications,[39] and cognitive behavioral therapy (CBT).[40,41] Among these, CBT is the most common approach. For ARFID patients with gastrointestinal diseases, CBT helps systematically and gradually increase tolerance to specific foods and food quantities, reducing fear and anxiety related to gastrointestinal sensations and symptoms.[20] It facilitates weight gain, improves nutritional status and dietary quality, and alleviates the psychological and medical consequences of avoidant/restrictive eating behaviors.[42] Currently, CBT for ARFID patients is primarily conducted in outpatient feeding and eating disorder clinics. Some scholars have also conducted research in the context of gastrointestinal diseases. For example, Burton[31] conducted an 8-session cognitive-behavioral treatment for 14 adults with DGBI and ARFID. The treatment program included education about DGBI, normalization of eating patterns, individualized behavioral exposure, and a post-treatment maintenance plan. This program, designed specifically for individuals with ARFID and functional gastrointestinal diseases (ie, gastrointestinal issues without structural abnormalities), has

proven to be highly feasible and acceptable, improving clinical outcomes.[31] In addition, a combination of family therapy, CBT, and psychiatric medication has also shown benefits for ARFID patients. Ketchem's study[25] found that among ARFID patients with eosinophilic esophagitis (EoE) receiving psychiatric medication, 71% showed improvements in symptoms and histological response, with an average weight gain of 2.4kg to 3.0kg. It is indisputable that, in the management of gastrointestinal ARFID patients, gastroenterology providers should consider psychological, nutritional, and behavioral risk factors, as well as quality of life. A multidisciplinary team, including gastroenterologists, nutrition specialists, and psychologists, can provide comprehensive treatment services.[23,25,26,34]

## Discussion

Previously, nutritional issues in patients with gastrointestinal diseases were typically attributed to pathological factors, while potential psychosocial factors and eating behavior disorders were often overlooked. However, as a relatively new concept in the field of mental health, ARFID has not yet been widely recognized or accurately defined in clinical practice. As a result, symptoms of food avoidance or fear of eating in patients with GI diseases are often ignored or simply rationalized. Since the understanding of such concepts may vary across disciplines and cultures, concept analysis provides a scientific, systematic, and consistent approach to refine and clarify them. Based on this, the present study proposes a comprehensive and representative definition of ARFID in adult patients with GI diseases for the first time (the conceptual map is shown in Figure 2), aiming to help healthcare providers better understand this phenomenon.

A systematic understanding of the epidemiological characteristics of ARFID in patients with GI diseases is still lacking. Significant variability in ARFID prevalence has been observed across different GI conditions. In the included studies, the prevalence of ARFID was reported to be as high as 40% among individuals with DGBI,[27] whereas the positive screening rate among adults with IBD was 17%.[28] A retrospective cohort study targeting patients with neurogastroenterological disorders further revealed substantial heterogeneity in ARFID prevalence, ranging from 6% to 24%.[21] These condition-specific differences in prevalence suggest a potential association between the GI diseases and the risk of developing ARFID. However, empirical evidence elucidating the factors contributing to this variability remains limited. In particular, multidimensional indicators including biological markers, psychosocial factors, and environmental variables remain insufficiently explored. And there is no consensus on clinically meaningful predictors of ARFID in this population. Therefore, cross-sectional studies are urgently needed to identify core risk factors for ARFID in the context of GI diseases, alongside longitudinal research to explore the dynamic interactions among multiple contributing factors throughout the course of disease development.

Based on the current state of research, our study indicates that gastrointestinal diseases can lead to food fear and food avoidance, resulting in eating disorders in patients. Some studies also suggest a potential bidirectional relationship between GI diseases and ARFID[43] meaning that ARFID may not only be a consequence of GI diseases but could also, to some extent, influence the onset and progression of these diseases. At present, there is insufficient research to establish a clear causal relationship between the two. Therefore, when evaluating the impact of GI diseases on ARFID, a dialectical approach is necessary. This includes considering gastrointestinal diseases as antecedents that disrupt eating behaviors, as well as analyzing the consequences of ARFID in these patients, such as its effects on gastrointestinal symptoms and its possible role in exacerbating the disease. The neurobiological basis of this bidirectional interaction has

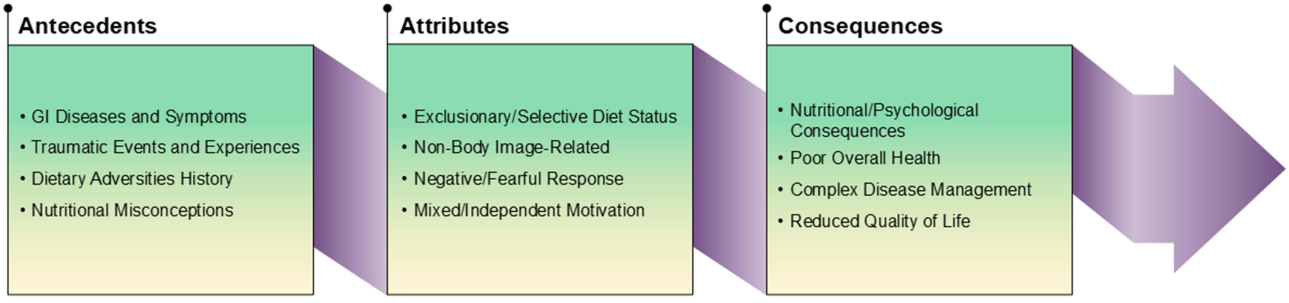


**Figure 2** Conceptual Map Of Avoidant/Restrictive Food Intake Disorder In Adult Patients With Gastrointestinal Diseases.

been elucidated to some extent in the three-dimensional model of ARFID proposed by Thomas.[44] This model suggests that the core manifestations of ARFID are associated with abnormal neural processing of stimuli. In particular, individuals with ARFID comorbid with GI diseases often exhibit excessive neural reactivity to fear-related stimuli. Such abnormal neural sensitivity may represent a critical nexus linking GI diseases with the development of ARFID. Future research should explore the bidirectional mechanisms between ARFID and GI diseases in adults, with a focus on the interaction between neurophysiological and psychosocial factors. A deeper understanding of this complex relationship can inform the development of more precise and effective clinical interventions.

Among the results of this study, we found that traumatic events and experiences, such including surgical procedures and negative eating experiences, serve as antecedents of ARFID in adults with GI diseases. In clinical practice, patients who have undergone gastrointestinal surgery or chemotherapy often exhibit food avoidance or fear, which may be closely related to ARFID.[6] However, to date, no in-depth studies have specifically targeted these populations. This research gap may be related to certain limitations in the current diagnostic tools for ARFID. The existing diagnostic tools are primarily based on the NIAS, but the diagnostic threshold for this tool has not yet reached a consensus, leading to situations where many patients, although not meeting the full diagnostic criteria, still exhibit avoidant or selective eating behaviors. These behaviors may pose health risks, especially in the absence of effective interventions, possibly leading to negative consequences.[29] Therefore, we recommend conceptualizing ARFID in the context of GI diseases as a clinical spectrum, with formal diagnosis warranted only when eating behaviors clearly fall outside normative adaptive ranges.[45] Nevertheless, the specific threshold for this adaptive range remains unclear and requires further rigorous research to validate. It is important to note that current research on ARFID in adults with GI diseases exhibits significant geographical concentration. Among the studies included in our study, 81.8% originated from the United States, and White participants comprised the majority in studies that reported racial demographics. Such geographical concentration may obscure culturally specific symptom presentations. This bias may stem from multiple factors. First, as ARFID was only recently incorporated into the DSM-5, early research has naturally been concentrated in the country where the diagnostic criteria were first established. Second, the United States has seen relatively advanced development in interdisciplinary research combining gastroenterology and psychiatry. Third, existing assessment tools are largely constructed within the framework of Western dietary culture. In China, although researchers have undertaken the translation and validation of the NIAS in university populations,[46] threshold determination for clinical relevance in gastrointestinal populations remain unresolved.[34,47] These observations underscore the need for further refinement and improvement of current diagnostic tools, particularly regarding the applicability of symptom specificity and threshold determination across diverse clinical contexts. These concerns align closely with the research agenda proposed by Scarlata,[45] who advocate for the expansion or revision of current ARFID assessment instruments and their systematic validation in GI populations. Given the considerable clinical overlap between ARFID and GI symptoms, it is also essential to more rigorously delineate the diagnostic boundaries of ARFID to minimize the risk of overdiagnosis due to symptom conflation.

An undistorted perception of body image is a key conceptual attribute of ARFID in adult patients with gastrointestinal diseases. Although these patients often experience weight loss due to disease-related factors, psychological distress, and changes in eating behavior, their body image perception remains unaffected. Most express a desire to gain weight or improve their dietary intake. However, unpleasant eating experiences often lead to strong negative reactions in these patients, causing them to associate eating with disease exacerbation or symptom intensification. Even though some patients receive guidance from dietitians and follow an elimination diet at certain stages, relying solely on dietary recommendations or prescriptions from a specific phase to guide the entire treatment cycle of the disease cannot address the complexity of its dynamic progression. As the disease progresses, patients' dietary needs and conditions change, so it is necessary to fully consider their history of exclusionary diets and the associated eating disorders. Analysis of the included literature indicates that dietary and nutritional misconceptions are commonly observed in patients with GI diseases and may be one of the contributing factors to the development of ARFID. During clinical assessment, it is essential to systematically trace the driving factors behind changes in their eating behaviors. If inaccurate beliefs (such as unreasonable fears of certain foods or misunderstandings about nutritional needs) are identified as primary drivers, intervention strategies should move beyond traditional dietary guidance and focus on improving patients' nutritional literacy and eating-related awareness.[34] A multidisciplinary management strategy that integrates physiological, psychological, and behavioral therapies is essential for patients with GI diseases who exhibit

symptoms of ARFID.[4] This approach facilitates the development of a sustainable and adaptive eating pattern, improves disease outcomes, enhances quality of life, and contributes to overall health.

Before conducting an in-depth investigation into ARFID in the context of GI diseases, it is crucial to first clarify its conceptual features, with particular attention to its distinguishing characteristics relative to the general population. This study employs Rodgers' evolutionary concept analysis to clearly define ARFID in adult patients with GI diseases and to identify its antecedents and consequences, thereby providing a theoretical foundation for further research. This not only contributes to the early identification of patients with food avoidance in future clinical practice, but also provides scientific evidence for future ARFID interventions and risk prevention strategies. Notably, the present concept analysis reflects the current stage of research, and the definition of ARFID in this population may require further refinement as more empirical evidence and theoretical insights become available.

## Limitation

First, we included only published studies in Chinese and English, which may have led to the omission of important evidence published in other languages. Second, due to the non-peer-reviewed nature of gray literature and the difficulty in accessing such materials, these sources were not included in our analysis. Third, as the present study focused specifically on adult populations, we only reviewed studies involving adult participants. These limitations in our search strategy may have constrained the comprehensiveness of our understanding of ARFID in individuals with gastrointestinal diseases. Furthermore, the existing body of research shows significant geographic limitations, resulting in a relatively homogeneous sample in terms of ethnicity and regional representation. This limitation may affect the applicability of our findings to regions with distinct dietary cultures.

## Conclusion

In individuals with GI diseases, ARFID remains a largely under-recognized diagnosis, and there is currently a lack of conceptual research on this condition. Therefore, conducting a concept analysis for this specific group is of great significance. The aim of this study is to clarify the concept of ARFID in adult patients with GI diseases from multiple dimensions, including antecedents, consequences, development and use, in order to enhance clinical awareness and symptom sensitivity. By analyzing and defining the characteristics of ARFID in adult patients with GI diseases, we can identify maladaptive eating behaviors at an early stage in the future, address food-related fears, and help patients make healthier dietary choices, thereby preventing the pathological development of eating behaviors. Besides, a comprehensive understanding of this concept not only enriches the application of ARFID in adult patients, but also highlights underexplored areas, such as the lack of studies on the prevalence of food avoidance in cancer or post-chemotherapy patients. The findings provide a conceptual foundation and direction for further exploration in related fields. More importantly, the results of this study can guide the design and optimization of assessment tools, facilitating the development of dietary management and related intervention research for patients with GI diseases.

## Abbreviations

ARFID, Avoidant/Restrictive Food Intake Disorder; GI, Gastrointestinal; NEDA, National Eating Disorders Association; IBS, Irritable Bowel Syndrome; SMAS, Superior Mesenteric Artery Syndrome; DGBI, Disorders of Gut-Brain Interaction; IBD, Inflammatory Bowel Disease; EA, Esophageal Achalasia; GP, Gastroparesis; CD, Celiac Disease; EoE, Eosinophilic Esophagitis; FD, Functional Dyspepsia; AN, Anorexia Nervosa; BN, Bulimia Nervosa; HRQoL, Health-Related Quality of Life; FRQoL, Food-Related Quality of Life; ED, Eating Disorders; FEDs, Feeding/Eating Disorders; EDNOS, Eating Disorders Not Otherwise Specified; NIAS, Nine Item Avoidant/Restrictive Food Intake Disorder Screen; CBT, Cognitive Behavioral Therapy.

## Ethical Approval

This survey was based on the literature review, we did not apply for ethical approval. However, we still followed the Helsinki Declaration to ensure good practices during the research study.

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## Disclosure

The authors report no conflicts of interest in this work.

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