Avoidant/Restrictive Food Intake Disorder: A Systematic Scoping Review of the Current Literature

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Abstract

Avoidant/restrictive food intake disorder (ARFID) was recently introduced to psychiatric nosology to describe a group of patients who have avoidant or restrictive eating behaviours that are not motivated by a body image disturbance or a desire to be thinner. This scoping review aimed to systematically assess the extent and nature of the ARFID literature, to identify gaps in current understanding, and to make recommendations for further study. Following an extensive database search, 291 unique references were identified. When matched against pre-determined eligibility criteria, 78 full-text publications from 14 countries were found to report primary, empirical data relating to ARFID. This literature was synthesised and categorised into five subject areas according to the central area of focus: diagnosis and assessment, clinical characteristics, treatment interventions, clinical outcomes, and prevalence. The current evidence base supports ARFID as a distinct clinical entity, but there is a limited understanding in all areas. Several possible avenues for further study are indicated, with an emphasis placed on first parsing this disorder's heterogeneous presentation. A better understanding of the varied mechanisms which drive food avoidance and/or restriction will inform the development of targeted treatment interventions, refine screening tools and impact clinical outcomes.

Keywords: ARFID; eating disorder; feeding disorder; new diagnostic categories; nosology; DSM-5.

1. Introduction

Avoidant/restrictive food intake disorder (ARFID) was introduced as a formal diagnostic category in 2013 in the Diagnostic and Statistical Manual, Fifth Edition (DSM-5) and more recently in the 11th Revision of the World Health Organisation's International Classification for Diseases (ICD-11). ARFID is defined as a persistent disturbance in feeding or eating that can result in severe malnutrition, significant weight loss or a failure to gain weight, growth compromise, and/or a marked interference with psychosocial functioning. ARFID provides a diagnostic label for a heterogeneous group of individuals across the age range who engage in avoidant or restrictive eating behaviours without weight or body image concerns (APA, 2013; Claudino et al., 2019).

Since clinical observations and scientific reports have demonstrated substantial variability in the presentation of ARFID, three examples of features that may be driving disturbances in eating behaviours are currently included in the DSM-5 diagnostic criteria: (1) an apparent lack of interest in eating; (2) an avoidance based on the sensory characteristics of food; and (3) a concern about the aversive consequences of eating (APA, 2013). It is important to note that this list is not mutually exclusive and not intended to be exhaustive, with the diagnostic manuals acknowledging that other causal processes can underpin restrictive eating in ARFID. Instead, they are intended as a first step towards parsing variability in ARFID and understanding its underlying causes.

Despite a burgeoning body of literature, to our knowledge no studies have systematically synthesised the full ARFID evidence base. A search of existing evidence syntheses identified three systematic reviews; one focusing on evaluating the diagnostic validity of the ARFID DSM-5 criteria (Strand, von Hausswolff-Juhlin & Welch, 2018), another assessing the standard of care provided to patients with chronic food refusal, including those with ARFID (Sharp et al., 2017b) and finally, one reviewing the use of cyproheptadine in stimulating appetite and weight gain (Harrison et al., 2019). Similarly, despite an encouraging number of non-systematic reviews which provide valuable insights into existing research and current understanding (Bryant-Waugh & Kreipe, 2012; Kreipe & Palomaki 2012; Bryant-Waugh, 2013b; Norris et al., 2016; Herpertz-Dahlmann, 2017; Mammel & Ornstein, 2017; Zimmerman & Fisher, 2017; Ushay & Seibell, 2018; Coglan & Otasowie, 2019), a systematic overview of the literature as a whole is lacking. Thus, the present review sought to investigate the scope and

nature of available evidence relating to ARFID in order to (1) synthesise current knowledge on ARFID and (2) identify knowledge gaps for further study.

2. Methods

2.1. Literature search

In consultation with a subject liaison librarian for biosciences & psychology, a systematic search was conducted in December 2018. An additional update search was conducted in April 2019 just prior to final analyses and newly published studies retrieved for inclusion. Studies were identified by searching the electronic databases Embase, Medline, PsycInfo, Scopus, Web of Science, and Cochrane Library using the search terms “ARFID” OR “Avoidant Restrictive Food Intake Disorder” without filters, restrictions or limits.

As our principal aim was to identify studies presenting primary data explicitly relating to ARFID as a diagnostic entity, it was felt that this search terminology would adequately capture all studies relevant for the purpose of this review. As such, no further search terms, keyword combinations or search variations were used. Following this, reference lists of relevant papers were hand-searched for further citations of interest which were missed by the initial database search.

2.2. Eligibility criteria

Studies adhering to the following criteria were included in this review:

1. Full-text publications reporting primary, empirical data explicitly relating to the diagnostic entity of ARFID (as described in DSM-5 or ICD-11)
2. Studies including one or more individual of any age with an ARFID diagnosis (as well as those likely to meet ARFID criteria if they were to be assessed, or those found to meet ARFID criteria retrospectively), including single case studies and case series presenting quantitative data regarding the presentation, course, treatment or outcome of ARFID
3. Articles available in English

2.3. Screening and selection process

The primary database search yielded a total of 783 records and three additional records were identified through hand-searching. Following the removal of 495 duplicate publications, titles and abstracts were screened manually, with book chapters, articles not available in English and studies not relating to ARFID as a feeding or eating disorder excluded. For articles passing the initial screening, full text journal articles were retrieved, read and screened against eligibility criteria (see Figure 1). To check the reliability of this process, a second independent rater (J.C.) was given a random sample of 40 of the 172 full-text articles to review against the inclusion criteria. Interrater reliability between the first and second rater was almost perfect (97.5% agreement).

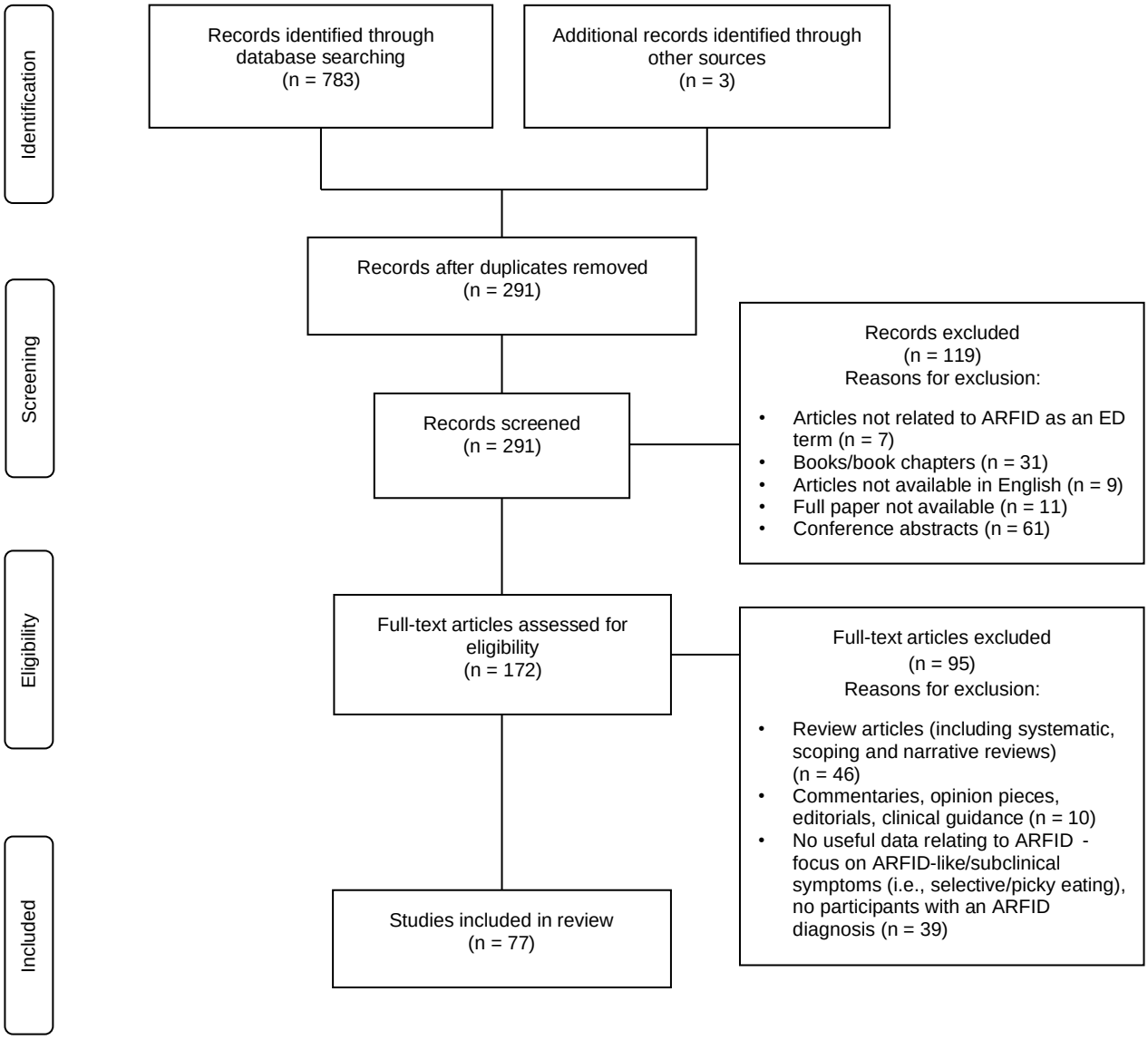

Fig 1. Flow diagram of reviewed studies

3. Results

Following a comprehensive search across a range of databases, 77 studies were identified for inclusion in the review. To synthesise this literature, articles were categorised into five subject areas according to their central focus: diagnosis and assessment, prevalence, clinical characteristics, treatment interventions, and clinical outcomes (Figure 2). This process was completed independently by both the first (L.B.) and second (J.C.) raters. Any discrepancies highlighted during the categorisation process were discussed and consensus reached.

Details of each study included in the review are provided in Tables 1, 2, and 3. The three categories, clinical characteristics, treatment interventions, and clinical outcomes overlap to some extent, but each provide unique information relating to the topic of ARFID. As such, we have discussed them separately in the results section, but presented them together in Table 3.

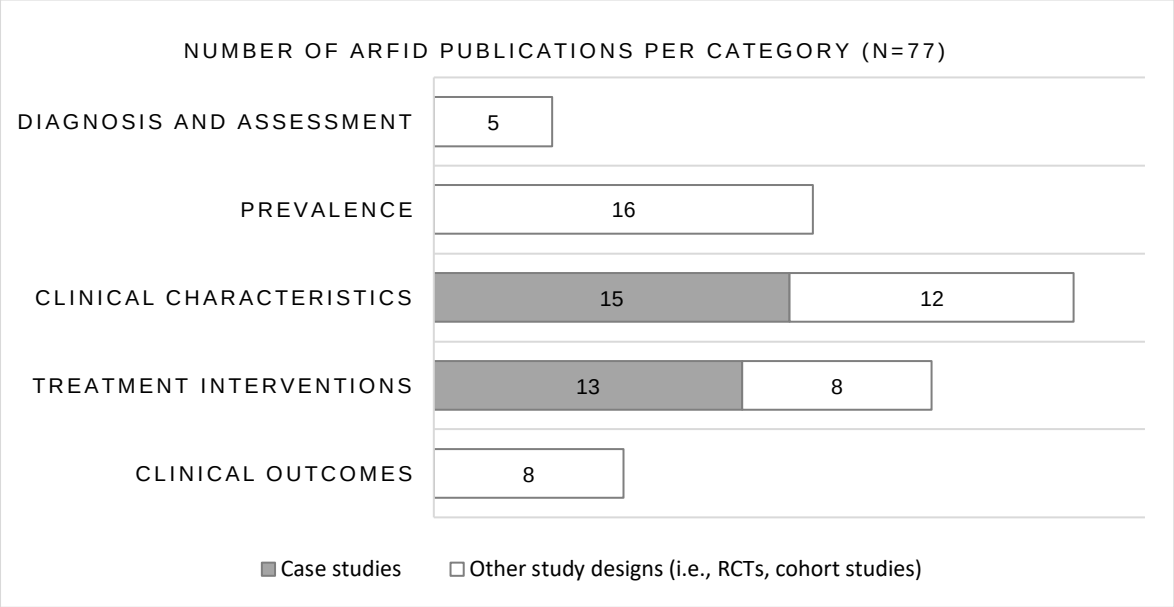

Fig 2. Number of articles per category

3.1. Diagnosis and assessment

3.1.1. Diagnostic instruments

Given the varied presentation of ARFID, a standardised and well-validated clinical instrument is key to confer diagnosis. Two articles presented data on tools used to assess the presence of ARFID

symptoms and generate a diagnosis, namely the Pica, ARFID and Rumination Disorder Interview (PARDI) and the Eating Disorder Examination - ARFID module (EDE-ARFID).

Bryant-Waugh et al. (2018) tested the feasibility and psychometric properties of the PARDI, a multi-informant, semi-structured interview designed to assess both the global presence of ARFID and provide dimensional ratings across its three main profiles. This initial pilot study, which recruited participants with ARFID (*n* = 39), those without an ARFID diagnosis but displaying clinically significant avoidant or restrictive eating (*n* = 8) and healthy controls (*n* = 10), revealed good internal consistency across all subscales and moderate inter-rater reliability. Larger scale studies are now underway to test the PARDI's sensitivity, specificity, convergent validity and discriminant validity.

In a similar study, Schmidt et al. (2019) tested the EDE-ARFID module, which is both a diagnostic instrument and a tool used to gather clinical information relating to ARFID psychopathology. Two independent raters administered the EDE-ARFID module to a non-clinical sample of 39 children with restrictive eating behaviours as well as their parents. High convergence of diagnoses was shown between the two raters and between the child and parent report, which indicates that that the EDE-ARFID may have the potential to accurately capture ARFID symptoms.

3.1.2. Screening instruments

A further three articles were found to present empirical data on self-report screening instruments designed to identify ARFID behaviours, yield initial symptomatic data and aid with clinical decision making.

Based on DSM-5 criteria for ARFID (APA, 2013), the Eating Disturbances in Youth Questionnaire (EDY-Q; Hilbert & van Dyck, 2016) is a self-report measure comprising 12-items designed to detect early-onset eating disturbances in 8 to 13-year olds. Two preliminary studies, both using the same non-clinical cohort of 1,444 school children in Switzerland, demonstrated adequate discriminant and convergent validity, and offered initial support for the existence of distinct variants of avoidant/restrictive eating behaviours (Kurz et al., 2015; 2016). Though further validations are

needed, the EDY-Q seems to be a promising instrument for assessing eating disturbances characteristic of ARFID, which warrants further study.

The literature regarding screening for ARFID behaviours in the adult population is scant. Indeed, just one measure, the Nine Item ARFID Screen (NIAS), was found with an exclusive focus on evaluating selective and restrictive eating behaviours in adults. Zickgraf and Ellis (2018) administered the NIAS to a non-clinical sample of 1,271 US adults and college undergraduates, reporting preliminary success in detecting ARFID-associated eating behaviours as well as high internal consistency and convergent and discriminant validity with other measures used to assess eating disturbances. The validity of this measure across different age groups as well as clinical populations is, however, yet to be established.

[TABLE 1 HERE]

3.2. Prevalence

The search yielded 16 articles which sought to determine the prevalence of ARFID. Significant variation in prevalence estimates is observable, with preliminary estimates among clinical ED populations ranging from 1.5% to 64% (Ornstein et al., 2013; Fisher et al., 2014; Forman et al., 2014; Nicely et al., 2014; Norris et al., 2014; Williams et al., 2015; Cooney et al., 2018; Krom et al., 2019) and <1% - 15.5% in non-clinical cohorts (Hay et al., 2017; Gonçalves et al., 2018; Chen et al., 2019).

Further, although ARFID comprises multiple aetiologies, clinical populations are found to display some demographic similarities. The literature consistently reports that ARFID patients are younger than non-ARFID ED patients, more likely to be male and report a longer duration of illness, on average, compared to anorexia nervosa (AN) or bulimia nervosa (BN; Norris et al., 2014; Forman et al., 2014; Fisher et al., 2014; Nicely et al., 2014; Fisher et al., 2015). Importantly, however, much of our current understanding is based on the study of relatively small, clinical samples, particularly those who have presented to an ED programme or sought help from a physician specialising in EDs (Ornstein et al., 2013; Fisher et al., 2014; Forman et al., 2014; Nicely et al., 2014; Norris et al., 2014; Fisher et al., 2015; Williams et al., 2015; Cooney et al., 2018).

While the vast majority of studies surveyed the prevalence of ARFID in children and adolescents, one study focused on older adolescents and adults (Hay et al., 2017). The authors conducted two population-based surveys in 2014 (*n* = 2,732) and 2015 (*n* = 3,005) which sought to determine the three-month community prevalence of various EDs as well as health-related quality of life (HRQoL). Participants over the age of 15 were systematically recruited from "collector" districts in South Australia and interviews designed to elicit information about various ED features. The authors reported a very similar three-month prevalence of ARFID in 2014 and 2015 (0.3% CI 0.1-0.5 and 0.3% CI 0.2-0.6 respectively) and found that those with ARFID experienced more non-functional days compared to those without EDs. The authors also observed poor mental HRQoL across all ED groups, but noted that this was particularly poor for those with ARFID. Further, although numbers were too low to confidently comment on the sex distribution of ARFID in adults, the authors did observe that it is more likely to occur in males, as is the case with children (Fisher et al., 2014; Nicely et al., 2014). Despite the need to validate presumptive diagnoses born from the subjective, self-evaluative interviews used, the study highlights the potential negative impact and functional impairment associated with ARFID symptoms.

[TABLE 2 HERE]

3.3. Clinical characteristics

Twenty-seven of the publications reviewed reported primary data relating to the clinical characteristics of ARFID, over half of which (n = 15) were single case studies or case series. The literature states that ARFID commonly presents alongside various medical and psychiatric comorbidities, including attention deficit hyperactivity disorder, autism spectrum disorder (hereafter 'autism') and internet gaming disorder (Bryant-Waugh, 2013a; Fisher et al., 2014; Nicely et al., 2014; Eddy et al., 2015; Pennell et al., 2016; Lucarelli et al., 2017; Cooney et al., 2018; Hadwiger et al., 2019). Further, though associated with a high degree of co-morbid anxiety disorders (Norris et al., 2018; Okereke, 2018; Zickgraf et al., 2019b) ARFID patients are found to be less prone to mood disorders than those with other eating disorders (EDs; Fisher et al., 2014; Nicely et al., 2014).

The current literature supports the existence of different ARFID presentations which vary according to the main driver of food avoidance. This has prompted efforts to investigate the validity of the three examples of features included in the DSM diagnostic criteria (Norris et al., 2018; Zickgraf et al., 2019a; Reilly et al, 2019). Though presentations characterised by one of each of these three features have been observed and reported (Lopes et al., 2014; Lucarelli et al., 2017; Thomas et al., 2017a), individuals often present with multiple characteristics which overlap and co-occur (Murphy & Zlomke, 2016; Aloi, Sinopoli & Segura-Garcia, 2018; Görmez et al., 2018).

Additional work investigating different ARFID 'types' has also emerged from a surveillance study performed across Australia, Canada and the UK, in which paediatricians and child psychiatrists were asked to report symptoms of any child younger than 12 years (n = 436) with a newly diagnosed restrictive ED. Latent class analysis across all three countries revealed two distinct clusters, one of which was characterised by considerable weight preoccupation and/or body image distortion and the other was related to a greater incidence of somatic complaints (Pinhas et al., 2017).

The search yielded nine studies which compared the medical and psychological profile of patients with ARFID and other restrictive EDs. Whilst similar levels of dietary restriction were observed in the cohorts studied, patients with ARFID were found to display clinically-distinct presentations compared to those with other EDs, including a history of abdominal pain, a longer length of illness and a distinct absence of any cognitions relating to weight or body image (Nakai et al., 2017; Becker et al., 2018; Izquierdo et al., 2018; Lieberman et al., 2019). Several case studies (n = 6) also reported that ARFID can develop in the context of various secondary medical or psychiatric illnesses, including food avoidance associated with drug use (Lazare, 2017), dietary restriction due to gastrointestinal discomfort following surgery (Tsai et al., 2017) and two cases of ARFID occurring alongside psychosis (Wassenaar et al., 2018; Westfall et al., 2018).

3.4. Treatment interventions

3.4.1. Pharmacological treatment

Six studies reported on the pharmacological treatment of ARFID and in particular, the use of medication as an adjunct to therapeutic intervention, which is recognised as an increasingly common

treatment approach. Owing to its success in treating AN (Brewerton, 2012), olanzapine was presented as a potential treatment strategy for relieving related symptoms of anxiety and promoting appetite (Brewerton & D'Agostino, 2017). Several other medications, including mirtazapine and buspirone, have surfaced as pharmacological candidates in the treatment of ARFID, both of which were found to relieve anxiety associated with choking and/or vomiting (Okereke, 2018; Tanidir & Hergüner, 2015). Gray et al. (2018) also reported on the use of mirtazapine to increase appetite and facilitate weight gain, but in contrast to Tanidir and Hergüner (2015), the authors noted heightened anxiety associated with an increased dosage. Thus, varying results have been observed.

The only double-blind, placebo-controlled study found to report on the efficacy of using medication to treat chronic food refusal took 15 children with ARFID and randomly assigned them to one of two conditions (Sharp et al., 2017a). While both groups participated in daily intensive behavioural intervention, eight were administered D-cycloserine (DCS) as an adjunct to therapy, and remaining participants given a placebo. Though a substantial improvement in mealtime behaviours was observed in both groups, DCS was found to enhance response to the behavioural intervention. These preliminary findings are a promising indicator that DCS is an effective adjunct to behavioural intervention, although larger clinical trials are warranted to fully verify this.

3.4.2. Psychological treatment

Five case studies were found to report on the use of cognitive behavioural therapy (CBT) to treat ARFID. In four studies, the interventions used CBT approaches to formulate and address eating-associated anxiety and fears about food consumption, without the focus on weight and shape concerns used in CBT methods for other EDs such as AN (Fischer et al., 2015; King et al., 2015; Aloi, Sinopoli & Segura-Garcia, 2018; Görmez et al., 2018). A fifth study employed a novel 4-week, exposure-based CBT intervention, developed to target other drivers of food avoidance and/or restriction (i.e., disgust sensitivity, dysfunctional cognitions about feared foods, the aversive consequences of eating) (Dumont et al. (2019).This method, which has been designed specifically for adolescents with ARFID and integrates inhibitory learning principles has demonstrated preliminary success in treating a number of ARFID presentations.

Two case series and one feasibility study were found to report on the use of family-based therapy (FBT) to treat ARFID (Lock et al., 2018; Spettigue et al., 2018; Lock et al., 2019). FBT, which is designed to empower caregivers, reduce familial guilt and support recovery at home, is often used in the treatment of EDs. Although FBT-ARFID is similar in this respect, and employs the main principles of FBT, it has been adapted to address the needs of patients with different ARFID presentations, targeting those with sensory sensitivities, fear-based concerns and a lack of interest (Lock et al., 2018). Though limited by small sample sizes and lack of a long-term follow up, the evidence suggests that FBT may prove to be a feasible treatment approach. In a similar manner, a small number of parent training curricula have been trialled which aim to coach caregivers in implementing at-home behavioural feeding interventions. Initial findings indicate that both parent teleconsultation and attendance at group education sessions can adequately prepare caregivers to support children who engage in severe selective eating but do not require treatment in a hospital setting (Bloomfield et al., 2019; Dahlsgaard & Bodie, 2019).

3.4.3. Multi-modal approach

Intervention-focused papers commonly endorse a multi-modal approach, characterised by input from a multidisciplinary team and incorporating a wide range of interventions (Murphy & Zlomke, 2016; Lenz et al., 2018; Spettigue et al., 2018). The efficacy of such an approach was supported by an RCT investigating the treatment of chronic food refusal in a day treatment programme (Sharp et al., 2016). The researchers randomly assigned twenty children aged 13-72 months to either a waiting list or a five-day intensive behavioural intervention with treatment input from a multidisciplinary team. Despite a small sample, the intervention group displayed significantly greater improvements ($P < 0.05$) on all primary outcomes, suggesting that a collaborative approach to treatment can safely and effectively address the challenging nature of food refusal.

3.5. Clinical outcomes

Given the relatively recent introduction of ARFID to psychiatric nosology, little research has monitored treatment outcomes. Six studies were identified with a focus on shorter-term clinical outcomes for ARFID patients amongst a larger, heterogeneous sample of those with DSM-5 restrictive EDs. In one such study, The Children's Hospital of Philadelphia's inpatient nutritional rehabilitation protocol was

tested with 215 ED patients (4% ARFID), reporting excellent outcomes in percent median body mass index (%MBMI), both at discharge and four weeks post-intervention. Though limited by a small sample, the researchers recognised that ARFID patients were more likely to rely on nasogastric feeds than patients with other EDs and that this subgroup of patients only demonstrated a significant weight gain later on in their hospital stay (Peebles et al., 2017). Bryson et al. (2018) found similar improvements in %MBMI for ARFID and AN patients treated in the same partial hospitalisation programme, with weight gain sustained at follow up (average 31 months after discharge) and Strandjord et al. (2015) found that ARFID patients required longer periods of inpatient admission than patients with AN. Despite these differences during treatment, ARFID and AN patients had similar outcomes 1 year after admission, with less than one quarter requiring readmission.

A further two papers were found to contribute longer-term outcome data relating to ARFID. Lange et al. (2019) followed 56 children originally treated for low-weight EDs (AN - 37, retrospective ARFID diagnosis - 19) after a mean of 15.9 years. At follow-up, a relatively high rate of ED was maintained in both the AN and ARFID group (21.6% and 26.3% respectively), although the AN group later presented with differing ED diagnoses, including eating disorder not otherwise specified and binge eating disorder. This was in contrast to the ARFID group, where all current ED cases continued to meet criteria for ARFID, providing support for the symptomatic stability of the disorder.

The second long-term study followed a cohort of children originally diagnosed with Infantile Anorexia (IA), evaluating level of malnutrition, eating attitudes and emotional/behavioural functioning at four assessment points (two, five, seven and 11 years) (Lucarelli et al., 2018). Although a steady improvement in the severity of malnutrition was observed over time, 61% continued to exhibit moderate to severe malnutrition at 11 years of age, and participants' emotional and behavioural problems and their mothers' psychopathological symptoms had worsened. It is important to note that participants were diagnosed with IA, regarded for the purpose of the study as the ARFID subtype "lack of interest in food or eating". Thus, the findings do not consider other features which may be driving the avoidance or restriction.

[TABLE 3 HERE]

4. Discussion

This systematic scoping review explored the extent and nature of the ARFID literature, with two main aims: (1) to synthesise current knowledge of ARFID and (2) to identify key gaps in the evidence base. In summary, the literature evidences ARFID as a distinct clinical entity with a specific symptomatic profile, but its heterogeneity has not yet been well captured by scientific studies. An understanding of the different drivers of food avoidance and/or restriction will help to develop effective treatments which impact clinical outcomes, and to refine screening tools which inform prevalence figures. Thus, developing our understanding of ARFID will be an iterative process whereby progress in one domain can contribute to advances in another.

Are there sound measures for assessing ARFID?

Research efforts are currently underway to design and validate instruments which reliably identify ARFID behaviours and capture meaningful clinical change, with promising psychometric validity observed thus far. Of these, the PARDI (Bryant-Waugh et al., 2018) shows particular promise, largely due to its sensitivity to three relevant ARFID profiles. Initial reliability and validity data show good feasibility and acceptability and adequate to good internal consistency for the three ARFID profiles (sensory sensitivity - 0.77, lack of interest in food or eating - 0.89 and fear of aversive consequences - 0.89) and larger scale, rigorous psychometric testing is underway.

How common is ARFID?

Since few epidemiological studies have reported on rates of ARFID, its true prevalence is currently unknown. While significant variation has been observed, estimates in the general population are consistently lower than those in clinical ED samples, where figures as high as 64% are reported (Krom et al., 2019). There are a number of challenges associated with the effective gathering of prevalence data, arguably the most crucial of which is the need for a structured assessment tool sensitive to the full range of ARFID presentations administered by a trained individual.

What do we know about the presentation of ARFID?

The literature consistently shows that ARFID captures a broad range of presentations, but little is understood about the nature of this heterogeneity. A common misconception perpetuated throughout current research is that ARFID patients can be classified according to one of three groups. While the DSM-5 criteria do include three ARFID presentations commonly seen in clinical settings, these are merely intended to serve as examples of features which may be driving the food avoidance or restriction. Though some headway has been made in exploring different drivers of food avoidance (Eddy et al., 2015; Norris et al., 2018), there is currently no conceptual or empirical evidence which shows that discrete groups exist.

How can we treat ARFID?

Broadly speaking, ARFID treatment is focused on increasing the amount or variety of food consumed by tackling the underlying driver of food avoidance and/or restriction. The literature evidences several promising treatment avenues which warrant further study, particularly family-based therapy (Lock et al., 2018; Lock et al., 2019), CBT (Dumont et al., 2019) and adjunctive pharmacological intervention (Sharp et al., 2017a; Gray et al., 2018; Spettigue et al., 2018), which appear to be the methods with the best evidence, resulting in the decrease or resolution of ARFID behaviours. A multi-modal approach is also endorsed, particularly for those with severe feeding difficulties (Sharp et al., 2017b) and the overall consensus is that this must be individualised, depending on the main concern and degree of severity. Despite the phenotypically heterogeneous nature of ARFID, there is currently no direct evidence that different presentations warrant diverse interventions. Indeed, Dumont et al. (2019), have demonstrated that a flexible CBT approach can be used to treat ARFID with several presentations. Of course, we will only be able to recognise whether different methods are necessary when we know more about the nature of this heterogeneity and begin to test patient responses.

What are the outcomes for ARFID patients?

The literature regarding ARFID outcomes is scarce and relies largely on the medical monitoring of low-weight patients who have presented to ED inpatient programmes (Forman et al., 2014; Peebles et al., 2017). Given that outcomes relating to weight restoration do not provide a complete picture of recovery, further work should look to measure the full range of physical and/or psychosocial consequences of ARFID.

What's next for ARFID?

Despite notable efforts to address pressing knowledge gaps, there is still a paucity of research and a continued need to develop a more sophisticated understanding of all aspects of this disorder. Looking ahead, we propose the following four areas of focus for the next five years:

(1) Parse the heterogeneity of ARFID by testing the different drivers of food avoidance/restriction

The findings of this review indicate that little can be learned from studying ARFID patients as a homogenous group. Thus, it is important that we better characterise the presentation of ARFID and proceed with an individualised appraisal. Although the current DSM-5 criteria offer three examples of features which may be driving food avoidance/restriction (APA, 2013), there are likely to be alternative causal processes which play a role in the onset and perpetuation of ARFID. As an example, cognitive inflexibility, a need for control and a preference for routine, which are commonly seen in autism and anxiety disorders, could all encourage restrictive eating behaviours, a limited food repertoire and/or rigidity relating to when, what or how food is consumed. Thus, these may offer promising avenues for further study.

(2) Rigorous psychometric testing of assessment instruments

Valid and reliable assessment instruments sensitive to a range of presenting features are fundamental for the accurate diagnosis of ARFID, the gathering of consistent prevalence data, and for measuring outcomes in treatment trials. While early evidence appears to support the sensitivity and validation of existing screening and diagnostic tools, it is clear that larger scale studies aimed at testing the performance and psychometric properties in both clinical and non-clinical populations across the lifespan are necessary. It is also important to recognise that advancements in our understanding of ARFID and in particular, a better conceptual understanding of the various presentations, will impact what, when and how we assess symptoms.

(3) Gather epidemiological data

Accurate and in-depth epidemiological data is central to advancing our understanding of ARFID. Asking questions such as 'When is ARFID most likely to emerge?', 'Are there

sex/gender effects?' and 'Does this vary according to the type of ARFID presentation?' will provide invaluable information about possible risk factors as well as informing prevention strategies and appropriate health care provisions. Looking ahead, there is also a need to clearly separate prevalence data derived from clinical samples, where figures are likely to be much higher, and non-clinical samples.

(4) Look beyond the scope of existing research

Most of the current ARFID literature is set within the context of feeding or eating disorders, but there may be value in looking beyond this. The psychobiology of appetite, for example, and its role in food avoidance may yield insights into the underlying biological bases of certain ARFID presentations. Research has shown that individuals who engage in binge eating behaviours exhibit a greater hedonic response to food (Dalton & Finlayson, 2014). It is therefore possible that individuals with ARFID, particularly those who exhibit an apparent lack of interest in eating, experience different responses to food, whether relating to sensory properties, taste, sensations of hunger and satiety or implicit wanting. Work in this area may contribute to a deeper understanding of the internal processes which determine the overall expression of appetite and reasons for avoidance/restriction. There are several other worthwhile directions for further research including an exploration of the occurrence and consequences of a late or false diagnosis, as well as an investigation into ARFID's psychiatric comorbidity, since it has been found to co-occur with various other diagnoses such as generalised anxiety disorder, obsessive compulsive disorder and autism (Cooney et al., 2018; Fisher et al., 2014; Kambanis et al., 2019). This will highlight shared underlying features which could be targeted for treatment and help to build an understanding of the symptoms that are unique to ARFID.

4.1. Limitations

Our search terms were confined to "ARFID" OR "Avoidant Restrictive Food Intake Disorder" without filters, restrictions or limits to ensure that we captured only those papers relating specifically to the diagnostic entity of ARFID. Though beyond the scope of this review, there is a wealth of literature relating to sub-clinical restrictive eating behaviours which are symptomatically similar to ARFID as well as studies pre-dating the introduction of ARFID, both of which provide valuable data for the field.

An evidence synthesis capturing the broader literature may offer a novel insight into alternative treatment options, early symptoms, risk factors or clinical outcomes.

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Conflicts of interest

None.

Ethical standards

Not applicable.

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Table 1. *Summary of articles relating to ARFID measurement instruments*

Author (Year) and country	Name of measurement instrument	Purpose of measurement instrument	Methodology and sample	Outcomes and psychometric findings (reliability and validity)
Kurz et al. (2015) Switzerland	Eating Disturbances in Youth-Questionnaire (EDY-Q)	Self-report scale which screens for ARFID symptoms based on the DSM-5 criteria	Screening for ARFID symptoms Children recruited from regular schools in Switzerland (n = 1,444), 8-13 years, 53.9% female	3.2% reported features of ARFID Three subgroups identified Good psychometric properties including adequate discriminant and convergent validity and acceptable internal consistency (Cronbach's a = 0.62)
Kurz et al. (2016) Switzerland	Eating Disturbances in Youth-Questionnaire (EDY-Q)	Self-report scale which screens for ARFID symptoms based on the DSM-5 criteria	Factor analysis of EDY-Q Children recruited from regular schools in Switzerland (n = 1,444), 8-13 years, 53.9% female	Three factors covering functional dysphagia, selective eating and food avoidance emotional disorder identified
Bryant-Waugh et al. (2018) UK, Switzerland & USA	Pica, ARFID and Rumination Disorder Interview (PARDI)	Multi-informant, semi-structured interview designed to assess the presence and severity of ARFID (as well as pica and rumination disorder)	Initial pilot study. Participants 10-22 years who completed either the child (n = 26) or young person/adult (n = 31) version of the PARDI Sample included healthy controls (n = 10) and those with clinically significant avoidant/restrictive eating/ARFID (n = 47)	All subscales achieved internal consistency ≥ 0.77 and inter-rater reliability for the ARFID diagnosis was moderate (k = 0.75)
Zickgraf & Ellis (2018) USA	Nine Item Avoidant/Restrictive Food Intake Disorder screen (NIAS)	Brief multidimensional instrument to measure ARFID-associated eating behaviours	Exploratory and confirmatory factor analysis (1) Semi-representative sample (n = 505, 69.5% female) - parents/guardians of children aged 5-17 who had been separately recruited for a study regarding their children's eating behaviour (2) Clinical sample (n = 455, 48.6% female) - US adults recruited from Amazon's Mechanical Turk with self-reported eating difficulties (3) College undergraduate sample (n = 311, 68.6% female) recruited through an advertisement with no mention of eating behaviour	Three-factor structure evidenced, supporting ARFID subtypes in the DSM-5 High internal consistency and test-retest reliability
Schmidt et al. (2019) Germany	Eating Disorder Examination: ARFID Module	ARFID module for the child and parent version of the Eating Disorder Examination (ChEDE) (diagnostic instrument)	Nonclinical sample of children (n = 39) with underweight and/or restrictive eating behaviours (8-13 years)	N = 7 children received an ARFID diagnosis High inter-rater reliability for ARFID diagnosis (92% for children and 97% for parents), high convergence between child and parent report (κ = 0.80)

Table 2. *Summary of ARFID articles relating to prevalence*

Author (Year)	Country	Sample size (n =)	Gender, age range (Mean, SD)	Sample	Type of assessment	ARFID prevalence estimate
Ornstein et al. (2013)	USA	215	88.6% female 8-21 years (15.4 ± 3.3)	Patients presenting for initial ED evaluation to adolescent medicine physicians in 2010 or 2011	Clinical interview (retrospective or concurrent presumptive diagnosis assigned)	14%
Fisher et al. (2014)	USA & Canada	712	8-18 years	Patients presenting to 7 adolescent medicine ED programmes in 2010	Retrospective chart review	13.8%
Forman et al. (2014)	USA	700	86.3% female 9-21 years (15.3 ± 2.4)	Patients presenting to 14 adolescent medicine ED programmes in 2010	Retrospective chart review	12.4%
Nicely et al. (2014)	USA	173	92% female 7-17 years (13.5 ± 2.03)	Patients admitted to an ED day programme between 2008 and 2012	Retrospective chart review	22.5%
Norris et al. (2014)	Canada	205	13.7 ± 2.5	Patients who received an initial ED intake assessment between 2000 and 2011	Retrospective chart review	5%
Eddy et al. (2015)	USA	2,231	53.4% female 8-18 years (13.0 ± 3.0)	Consecutive new referrals to 19 paediatric gastroenterology clinics in 2008	Retrospective chart review	1.5% (a further 2.4% with one or more ARFID symptoms)
Fisher, Gonzalez & Malizio (2015)	USA	309	83.2% female Mean age 15.4	Referrals to outpatient office of division of adolescent medicine for an ED evaluation	Evaluation by physician, nutritionist and social worker	19.4% (60 patients out of 309)
Williams et al. (2015)	USA	422	32% female 4-219 months (54.5 months ± 41.0)	Children referred to a multi-disciplinary paediatric feeding programme	Clinical assessment (BMI measurement, assessment of dietary intake and physical examination)	32%
Nakai et al. (2016)	Japan	1029	Predominantly female (n = 1017)	Patients who sought treatment for an ED at Kyoto University Hospital between 1990 and 2005	Retrospective chart review	9.2%
Seike et al. (2016a)	Japan	655 teachers	100% female	Yogo teachers working at elementary/junior high/senior high/special schools in Chiba Prefecture	Questionnaire survey	10.7% (14.8% - senior high schools, 11.1% - junior high schools, 10.0% - elementary schools, 6.3% - special needs schools)
Seike et al. (2016b)	Japan	1,886 teachers		Yogo teachers working at elementary/junior high/senior high/special schools working in four prefectures	Questionnaire survey	13.0%
Hay et al. (2017)	Australia	2732 (2014) 3005 (2015)	>15 years	Population-based study. Metropolitan and rural districts in South Australia systematically selected and 10 dwellings chosen within each district. Participants selected from each household	Interview featuring questions about eating behaviours)	2014: 0.3% (0.1-0.5) 2015: 0.3% (0.2-0.6)

Cooney et al. (2018)	Canada	369	<18 years	Patients who were assessed for an ED in a tertiary care paediatric hospital between 2013 and 2016	Retrospective chart review	8.4%
Gonçalves et al. (2018)	Portugal	330	50.9% female 5-10 years (7.6 ± 1.2)	Children attending primary schools and fluent in Portuguese and their parents	Child and parent-self report questionnaires (including the ARFID questionnaire, based on DSM-5 criteria)	15.5%
Chen et al. (2019)	Taiwan	4,816	47.7% female 7-14 years	Children from 69 schools in Taiwan	Face-to-face interviews using the K-SADS-E modified for the DSM-5 (plus parent completed questionnaires)	<1%
Krom et al. (2019)	The Netherlands	100	64.1% female Mean age 1.85	Patients referred by paediatricians or GPs because of feeding difficulties to the Diagnostic Centre for Feeding Problems in the Emma Children's Hospital/Amsterdam UMC	Participants assessed against DSM-5 criteria for ARFID	64%

Table 3. *Summary of ARFID articles relating to clinical characteristics, treatment interventions and clinical outcomes*

Author (year) and country	Study aim	Methodology and sample	Symptoms/presentation	Treatment	Outcome
Bryant-Waugh (2013a) UK (Clinical characteristics)	To present a case example of a patient with ARFID	Case study 13-year-old male BMI 16.5 (17_{th} centile)	• Diet missing major food groups (low in calcium, iron and vitamins) • Episodes of dizziness and lethargy • Fussy eater since childhood	• Broad CBT approach with parental involvement • Strategies included joint setting of goals, cognitive restructuring, anxiety management	• Growth velocity improved (height increased from 10_{th} to 35_{th} centile) • Better management of anxiety and improved nutritional intake although diet far from extensive
Chandran et al. (2015) Australia (Clinical characteristics)	To discuss an ARFID patient with multiple complex medical comorbidities	Case study 17-year-old male BMI 20.7kg/m_2	• Selective diet of 5 foods since age 5 • Patient in malnourished state - lethargy, dehydration, poor appetite, vomiting • Concurrent diagnosis of subacute combined degeneration of the spinal cord	• Inpatient management, multidisciplinary approach • Nasogastric tube fitted, routine psychotherapy, anxiety medication (quetiapine), family therapy	• BMI increased to 22.7kg/m_2, nasogastric tube removed, greater variety of food consumed • Progress appointment – weight increased to 100kg and patient no longer met criteria for ARFID
Fischer, Luiselli & Dove (2015) USA (Treatment interventions)	To evaluate the effects of an intervention for chronic food selectivity in an adolescent with ARFID	Case study 16-year-old-male	History of extreme food selectivity, associated feeding anxiety and some acute sensory aversion to certain foods	• Intervention incorporating both a clinic (behavioural treatment and CBT) and concurrent in-home component (enforced by the patient's mother) • Follow-up 1- and 3-month post treatment	• Greater consumption of foods (both quantity and variety) • Reduced anxiety and ability to eat out in a social environment • Daily bowel movements and increased energy (findings maintained post-treatment)
King, Urbach & Stewart (2015) USA (Treatment interventions)	To present a case of ARFID successfully treated with CBT	Case study 41-year-old female, BMI 15.5 kg/m_2	Patient had Crohn's disease as a child and developed severe illness anxiety following acute gastroenteritis which caused her to limit food intake	• Inpatient treatment - 8 sessions of CBT including psychoeducation, systemic desensitisation (in vivo exposure) and cognitive restructuring • Follow-up 8-months post treatment	• At discharge, patient was consuming 1650 calories daily and BMI 16.5 kg/m_2, and reported reduced anxiety and increased energy • At 8 months post-discharge, patient BMI was 19.4 kg/m_2
Strandjord, Sieke, Richmond & Rome (2015) USA (Clinical outcomes)	To compare patients with ARFID and AN (looking at differences in presentation, treatment response and 1-year outcomes)	Retrospective chart review of patients hospitalised between 2008 and 2014 ARFID patients (n = 41), 85% female, 14-18 years AN patients (n = 203), 89% female, 15-20 years	Patients treated for nutritional insufficiency and meeting DSM-5 criteria for an ED	• Hospitalisation for acute medical stabilisation • Follow-up 1 year after discharge	• ARFID and AN patients had similar outcomes 1 year after initial admission • Around half met criteria for remission and less than one-quarter for readmission • ARFID patients relied on more enteral nutrition and required longer hospitalisations

Tanidir & Hergüner (2015) Turkey (Treatment interventions)	To present a case of ARFID successfully treated with mirtazapine	Case study 10-year-old female Weight 26kg on admission (below 10th percentile)	Refusal to eat solid food after choking incident at 4 years old	• Initial behavioural approach • 10mg/day fluoxetine increased over time to 30mg/day for 2 months with no success • 15mg/day mirtazapine for 6 months	• Weight increased to 34kg (25-50th percentile) • Mirtazapine well tolerated - marked and rapid improvement in symptoms relating to choking phobia • Within 2 weeks, the patient reported less anxiety during mealtimes and experienced an increase in appetite • No re-emergence of complaints at 6-month follow up
Murphy & Zlomke (2016) USA (Treatment interventions)	To describe a behavioural feeding intervention used to treat a patient with ARFID	Case study 6-year-old female BMI 81st percentile (normal range)	• Gastroesophageal reflux disease • Began food refusal at 9 months old • Selective about food based on type, colour, texture, flavour and brand	• Behavioural feeding intervention with parent-training strategies • Follow-up 6-weeks post treatment	Increased dietary repertoire and clinically significant decrease in problematic child and parent feeing behaviours
Pennell, Couturier, Grant & Johnson (2016) Canada (Clinical characteristics)	To report two cases of patients with coexisting ARFID and ADHD	Case series (1) 10-year-old male BMI 17.2 (2) 9-year-old female BMI 11.4	(1) 1-year history of increasing food avoidance, oppositional mealtime behaviour and weight loss (11.8kg lost over 15 months) following initiation of ADHD medication (2) 3-6-month history of weight and height stunting following initiation of ADHD medication. Eating difficulties since infancy	(1) Inpatient case with 0.5mg risperidone to help restore appetite and target anxiety followed by biweekly outpatient care (2) Inpatient care, 30mg risperidone to restore appetite and improve concentration and anxiety followed by biweekly outpatient therapy	(1) Patient fully weight restored, and his mother reported a marked improvement in appetite and increased variety of foods eaten (2) Following 10 weeks of outpatient therapy, the patient was fully weight restored, experienced a substantial improvement in appetite and decreased oppositional behaviour
Sharp et al. (2016) USA (Treatment interventions)	To investigate the feasibility and preliminary efficacy of an intensive, manual-based behavioural feeding intervention for patients with chronic food refusal and/or dependence on enteral feeding	Randomised controlled trial at a multidisciplinary day treatment programme in the US (n = 20), 40% female, 13-72 months	Children exhibiting active and persistent food refusal with dependence on enteral or oral supplementation	• Manual based and technology supported behavioural feeing intervention - integrated eating aversion treatment (iEAT) • iEAT vs. waiting list control (10 children randomised to each condition) • 14 40-minute meal blocks across 5 consecutive days (meals 1-11 with trained therapists and 12, 13 and 14 parent-led) • Follow-up 1-month post treatment	• Children assigned to iEAT showed significantly greater improvements on all primary outcome measures compared with controls • At post-treatment follow up, all caregivers reported high levels of overall satisfaction with treatment
Brewerton & D'Agostino (2017)	To document the clinical progress of ARFID patients	• Retrospective chart review of 9 patients (8	Participants diagnosed with ARFID using DSM-5 criteria	• Adjunctive low-dose olanzapine (alongside meal	• Mean change in BMI 3.1 ± 1.34kg/m2

USA (Treatment interventions)	treated with low doses of adjunctive olanzapine	females and 1 male) (9-19 years) • Mean admission BMI 15.6 ± 1.8 kg/m2		behaviour therapy and other treatment modalities offered to ED patients) • Mean number of days on olanzapine 53.4 ± 22.4	• Mean change in BMI index-for-age percentile 11.0 ± 14.7 to 35.9 ± 27.5 • Olanzapine promoted weight gain in all patients and relieved symptoms of anxiety, depression and cognitive impairment
Kapphahn et al. (2017) USA (Clinical outcomes)	To assess outcomes at 1-year follow up for patients who were hospitalised compared to those who were not	• Retrospective chart review • Patients with restrictive EDs treated at 14 medicine-based ED treatment programmes in 2010 (n = 140) • 10% ARFID, 86% female, 9-21 years	N/A	• Various treatment modalities including medical hospitalisation, psychiatric hospitalisation, residential ED treatment, intermediate level care and outpatient treatment	• Patients who were hospitalised had 4 x the odds of being at least 90% MBMI at 1-year follow-up compared with those who were not hospitalised
Lazare (2017) Canada (Clinical characteristics)	To describe a patient with an initial diagnosis of ARFID complicated by cannabis use and a later diagnosis of Addison's disease	Case study 30-year-old female BMI 17	Reported use of cannabis to control nausea and increase appetite, low mood, anxiety and panic attacks, induced vomiting after eating without marijuana use, preference for high fat foods	• Admittance to inpatient medicine service and presumptive diagnosis of Addison's disease made • Hydrocortisone 10mg daily • Eventual discharge to residential facility	• Patient's eating completely normalised within a few days • Patient reported no nausea or vomiting, and anxiety resolved
Lucarelli et al. (2017) USA (Clinical characteristics)	To present a case of a young girl with a concurrent diagnosis of ARFID and ASD	Case study 4-year-old female	• Comorbid diagnoses of Gastroesophageal Reflux Disease and Autism Spectrum Disorder • Limited diet and rigidity around other aspects of feeding	• Feeding therapy using a systematic desensitisation approach with rewards	• Parents discontinued therapy with concerns that it was too harsh • Patient's weight stable but more difficult to manage behaviourally
Maertens, Couturier, Grant & Johnson (2017) Canada (Clinical characteristics)	To discuss the diagnosis, course, presentation and management of two patients with significant weight loss, food restriction and fear of vomiting	Case study (1) 15-year-old female (2) 10-year-old male	(1) Severe malnutrition (approx. 70% ideal body weight), recent episode of stomach flu, longstanding fear of vomiting, diagnosed with ARFID and OCD (2) 81% ideal body weight, intense fear of vomiting following bout of gastroenteritis	(1) 20mg Escitalopram once daily and 5mg Olanzapine for anxiety. CBT attempted for exposure to germs and contamination and for body image acceptance (2) Admitted to ED unit at 13-years-old. 5mg Olanzapine, later switched to 25mg Clomipramine. CBT with graded exposure to address illness fears and rituals	(1) Discharged from ED unit following weight restoration but struggled to maintain weight. Patient continued to meet criteria for OCD and later met criteria for AN (2) Patient discharged from ED unit following weight restoration with a diagnosis of AN, generalized anxiety disorder, and OCD
Maginot et al. (2017) USA (Treatment interventions)	To evaluate the safety of a higher calorie nutritional rehabilitation protocol for treating inpatients with restrictive EDs	Retrospective chart review of ED inpatients admitted to the Rady Children's Hospital in San Diego between Jan 2015 and	Patients diagnosed with AN, OSFED or ARFID based on the DSM-5 criteria met medical criteria for hospitalisation. 29% were severely malnourished (<75% expected body weight)	• Inpatient nutritional rehabilitation protocol • Average length of stay 15.3 days	• Higher calorie nutritional rehabilitation protocol tolerated for inpatients with restrictive EDs • Lower expected body weight on admission was a more important

		Mar 2016 (n = 87) (11.5% ARFID), 8-20 years			predictor of hypophosphatemia than initial calorie level
Nakai et al. (2017) Japan (Clinical characteristics)	To compare the clinical presentation of patients with ARFID compared to those with AN	Retrospective chart review of patients who sought treatment for an ED at Kyoto University Hospital between 1990-1997 (n = 245), 15-40 years, (11% ARFID)	• Patients meeting criteria for ARFID or AN • All ARFID patients were female • No patients reported food avoidance relating to sensory characteristics or functional dysphagia and all had amenorrhea	• Inpatient treatment programme combining individual psychotherapy and somatic therapy (nutritional management and enteral feeding) • All inpatient stays were <3 months • Follow-up 85.2 months (mean duration after entry)	• No significant group differences in the physical state scores (BMI and menstrual pattern) • ARFID group showed a significantly greater improvement in eating behaviours, psychological state, and psychosocial state than the AN group • ARFID group also had a significantly shorter duration of illness and lower rates of admission history
Ornstein et al. (2017) USA (Clinical outcomes)	To compare outcomes of patients with ARFID treated in a family-centred PHP compared to those with other EDs	Retrospective chart review of ED patients admitted to a family-centred PHP between Aug 2008 and May 2012 (n = 130) (25% ARFID), 92.3% female, 7-17 years	Patients exhibiting an acute onset of severe food restriction resulting in significant weight loss or failure to gain weight, patients who restrict their intake in an effort to avoid certain outcomes (choking, vomiting) or due to disgust	PHP with a focus on acute onset of severe food restriction resulting in significant weight loss or failure to gain weight (5 days per week for eight and a half hours a day)	• ARFID patients spent significantly fewer weeks in the programme than those with AN • Similar increase in %MBMI observed in AN, ARFID and OSFED patients • All patients demonstrated significant improvements in psychopathology (measured the ChEAT and RCMAS)
Peebles et al. (2017) USA (Clinical outcomes)	To report outcomes at admission, discharge and 4-week follow-up for patients with EDs	Retrospective chart review of ED patients admitted to the CHOP for a first time stay between 2012 - 2014 (n = 215) (4% ARFID), 88% female, mean age 15.3 years	20% malnourished below 75% MBMI, 335% bradycardic, 15% hypotensive and nearly 53% orthostatic on admission	• Medical stabilisation for inpatient nutritional rehabilitation (average length of stay 11 days) • Follow-up 4 weeks after discharge	• At follow up, patients averaged 100.9% MBMI at follow-up. Just 3.8% were re-hospitalised in the 30 days after discharge
Schermbrucker et al. (2017) Canada (Clinical characteristics)	To report a case of ARFID and explore the role of culture in diagnosis	Case study 11-year-old male, height 148.9cm (75th percentile, weight 33.1kg (10th percentile)	• Acute food refusal, medical instability, epigastric pain, constipation, dysphagia, fear of choking, bradycardic (56 BPM) • Concurrent diagnoses - generalised anxiety disorder, separation anxiety disorder	• Admittance to ED unit for weight restoration and nasogastric feeding • Fluoxetine to target anxiety symptoms • Patient refused to engage with food exposure tasks and complained of a physical aberrancy in his throat • Follow-up 2-months post-discharge	• Family self-discharged patient. At discharge, the patient weighed 39.8kg (97% of ideal body weight) • At two months follow-up, patient returned to clinic with a diagnosis of globus (physical, mobile lump in throat impeding the passage of food)

Sharp et al. (2017a) USA (Treatment interventions)	To examine the feasibility and preliminary efficacy of combining D-cycloserine with a behavioural intervention in treating young children with chronic food refusal	Double-blind, placebo-controlled study 16 children (37.5% female) 18 months – 6 years	Active and persistent food refusal which severely restricted the volume of food consumed	• Randomisation to intensive behavioural intervention + D-cycloserine OR intensive behavioural intervention + placebo over 5 days (15 meals in total) • Follow-up 1-month post-treatment	Mealtime behaviours improved significantly in both groups, but D-cycloserine further enhanced response to intervention, rapidly increased food acceptance and reduced disruptive behaviours
Thomas et al. (2017) USA (Clinical characteristics)	To describe a case of ARFID relating to an acute choking incident	Case study 11-year-old female, BMI 12.5	• Sudden onset of food refusal and weight loss following acute choking incident • Patient had been highly selective eater since infancy and disliked many foods	• Period of hospitalisation followed by cognitive behavioural intervention to target choking phobia and to increase dietary variety • Follow-up 1-year after initial assessment	• Patient gained 6.4 kg and grew 8cm in height one year after initial assessment • Diet still limited but all previously consumed solid foods were reincorporated • Patient no longer reported a fear of choking
Tsai, Singh & Pinkhasov (2017) USA (Clinical characteristics)	To present a case of ARFID resulting from testicular cancer surgery	Case study 56-year-old male	• Significant weight loss over the past 5 years, severe malnourishment due to restricted diet (liquid and pureed foods to reduce bowel movements) • Severe scarring in pelvic floor region following testicular cancer surgery causing pudendal nerve entrapment syndrome	• 22-day inpatient stay, IV fluid administration, liquid nutritional supplements • 7.5mg mirtazapine	• Upon discharge, patient was still fixated on constipation, failed to follow up with medical professionals and did not adhere to medication • Patient continued to eat pureed foods, drink nutritional drinks and use enemas to relive constipation • Continued weight loss, severe malnourishment and eventual anasarca
Aldridge et al. (2018) UK (Clinical characteristics)	To compare the feeding behaviours of children with ARFID to those of typically developing children	Observational study 18 children with ARFID and 21 typically developing children	N/A	N/A	• Group differences appear to relate to frequency rather than type of behaviour (food intake, visual and physical engagement with feeding, and movement during mealtimes)
Aloi, Sinopoli & Segura-Garcia (2018) Italy (Treatment interventions)	To present a case of ARFID successfully treated with CBT and family involvement	Case study 24-year-old male, slightly overweight with BMI 25.5 kg/m2	• Dysfunctional eating behaviours dating back to the age of 2 • Avoidance based on an unpleasant sensory experience • Complaints of anxiety relating to shared meals, resulting in social withdrawal	• Psychotherapeutic intervention once a week for one hour over six months • Phase 1 (session 1-4) psycho-education • Phase 2 (session 5-7) family therapy • Phase 3 (session 8-18) CBT • Phase 4 (session 19-20) relapse prevention • Follow up 6 months post-treatment	• Many new foods introduced to the patient's diet • Improved social relationships and willingness to engage in shared meals

Becker et al. (2018) USA (Clinical characteristics)	To compare the clinical presentations of ARFID and AN	138 individuals with an ED (n = 67 with ARFID, n = 71 with AN), 10-78 years, 73.8% female	N/A	N/A	• ARFID group - significantly higher proportion of males and presented for treatment at a younger age than the AN sample • Individuals with ARFID scored lower on measures of eating pathology, depression, anxiety and clinical impairment but did not differ from those with AN on restrictive eating
Bryson et al. (2018) USA (Clinical outcomes)	To assess long-term outcomes of patients with ARFID treated in a PHP for EDs	Retrospective chart review ARFID and AN patients treated in a PHP from Aug 2008 to May 2013: • ARFID (n = 20), 70% female, mean age 11.43 years • AN (n = 42), 97.6% female, mean age 14.12 years	• N = 5 patients with reported gastrointestinal complaints • N = 8 with a reported fear of choking or vomiting • N = 7 with restrictive eating due to: low appetite related to comorbid psychological conditions, severe picky eating, hypersensitivity to sensory qualities of food, idiosyncratic food rules, and/or family conflict	• PHP (including cognitive-behavioural interventions, meal planning and family therapy) • Follow up at least 12 months after discharge	• At follow up, all participants exhibited a significant increase in %MBMI from intake to discharge and maintained this at follow-up • Significant reduction in ED symptoms from intake to discharge and from discharge to follow-up (measured by the ChEAT) • Significantly smaller percentage of patients with ARFID were receiving outpatient services (compared to AN)
Chiarello, Marini, Ballerini & Ricci (2018) Italy (Clinical characteristics)	To discuss the presentation and clinical characteristics of an individual with ARFID	Case study 18-year-old male	• Very selective eating habits and nausea in the presence of non-preferred foods • Malnutrition causing progressive decrease in vision	• Inpatient care with multidisciplinary approach to treatment followed by outpatient CBT and parental psychoeducation • Sertraline up to 150mg/day • Follow-up 1-year post-treatment	• Improved nutritional intake, decreased anxiety during meals, improvement in right eye vision • One year follow up: no further recurrence of visual loss and no further improvements
Görmez, Kılıç & Kirpinar (2018) Turkey (Treatment interventions)	To present a case of ARFID successfully treated with CBT	Case study 27-year-old female BMI 16kg/m_2 (lost 6kg in the past 2 months	Nausea, retching, vomiting and unable to tolerate the sight and smell of food	• 12 40-minute weekly CBT sessions as an inpatient and 8 sessions as an outpatient as well as psychoeducation and dietary supervision • Also 30-45mg of mirtazapine	• 4kg gained (BMI 17.5kg/m_2. A further 2kg gained (BMI 18.3kg/m_2) 6-months post discharge • Improvement on cognitive domains, energy levels and anxiety
Gray, Menzel, Schwartz & Kaye (2018) USA (Treatment interventions)	To evaluate the use of mirtazapine in treating patients with ARFID	6 females, 8 males (7-23 years) who received treatment at the University of California, San Diego Eating Disorders Clinic from 2015 to 2016. Mean BMI at intake 16.8 ± kg/m_2	Difficulty eating related to low appetite cues, taste, or texture sensitivity, anxiety of an adverse event (e.g., choking), or significant functional gastrointestinal distress	• Six patients treated with mirtazapine as monotherapy and 8 on additional medications • Average dose of mirtazapine 25.5mg • Follow-up 6-months post-treatment and monthly follow-ups thereafter	• Average change in BMI without mirtazapine - 0.10 BMI point per week • Average change in BMI with mirtazapine - 0.23 BMI point per week (t_{13} = -3.11, $p < .05$) • Overall, mirtazapine was safe, well tolerated and encouraged greater weight gain than treatment-as-usual programme

Guss, Richmond & Forman (2018) USA (Treatment interventions)	To assess the inpatient medical management of adolescents with ARFID	Survey United States-based physician members of the Society for Adolescent Health and Medicine's Eating Disorder Special Interest Group's listserv or the National Eating Disorders Quality Improvement Collaborative (n = 37)	N/A	N/A	• Half of respondents did not use protocol for refeeding • 55% of those with a protocol used an AN treatment protocol • Solid food and nasogastric feeds were most commonly used for nutritional rehabilitation • Few typically prescribed medications in the hospital during medical stabilisation • There is considerable variability of practice in the treatment of ARFID
Izquierdo et al. (2018) USA (Clinical characteristics)	To assess implicit attitudes towards dieting and thinness in adolescents with fat-phobic AN, non-fat-phobic AN, low-weight ARFID and those with no ED	Comparative study N = 94 adolescent females, 10-22 years (n = 39 fat-phobic AN, n = 13 non-fat-phobic AN, n = 10 low-weight ARFID, n = 32 healthy controls)	• Participants meeting DSM-5 criteria for a low-weight ED or age-matched healthy controls	N/A	• Individuals with fat-phobic and non-fat-phonic AN had implicit associations with dieting and true statements but those with ARFID and HCs did not • Implicit association between non-dieting and true statements in those with ARFID is consistent with explicit endorsements of the absence of weight and shape
Lenz, Mitan, Kleinhenz & Matthews (2018) USA (Treatment interventions)	To describe the successful use of an intensive inpatient behavioural intervention in treating ARFID	Case study 8-year-old female diagnosed with ARFID	• Initially presenting with abdominal pain, nausea and vomiting which caused acute food refusal • Patient also stopped drinking fluids following a choking incident, which resulted in the placement of a nasogastric tube	• Initial outpatient treatment which employed family and individual therapy within a CBT framework • Subsequent inpatient admission to adolescent medicine service • 16 outpatient sessions over a 12-week period and a 6-day inpatient stay • Follow-up 4-months post discharge	• Patient weight increased from lowest 21.8kg to 26.5kg (52nd percentile) at 4-month follow up • Full remission of ARFID symptoms
Lock et al. (2018) USA (Treatment interventions)	To illustrate the use of FBT in treating pre-adolescents with ARFID	Case study (1) 8-year-old female (2) 9-year-old female (3) 11-year-old female	3 different ARFID presentations: (1) Low appetite and lack of interest in eating (2) Sensory aversion to food (3) Fear of eating and extreme fear of vomiting	Family Based Therapy	(1) No major changes in interest in food but capable of eating sufficient quantities and eating-related family conflicts decreased (2) Greatly increased range of food, increased flexibility in social situations (3) Coping strategies used to manage fears, steady weight gain and increased participation in school and social activities
Lucarelli et al. (2018) Italy	To assess the type and degree of malnutrition over time in children with IA	Longitudinal study evaluating children (and their mothers) originally	Patients originally diagnosed with IA but now meeting the criteria for	• Patients and their mothers had received some psychoeducation at the time	• Steady improvement in malnutrition but 73% continued to

(Clinical outcomes)		diagnosed with IA (n = 113), 49% female, 2.3 years (mean age at first assessment)	the ARFID subtype "apparent lack of interest in eating or food."	of diagnosis but did not pursue any psychotherapeutic treatment for various reasons • Patients assessed at a mean age of 2 and thereafter at 5, 7 and 11 years	exhibit mild, moderate or severe malnutrition at 11 years • Girls' emotional/behavioural problems and mothers' psychopathology were more severe than that of the boys and their mothers
Norris et al. (2018) Canada (Clinical characteristics)	To assess characteristics of ARFID and describe subtypes	Retrospective chart review Patients (n = 77) assessed in an ED clinic at a tertiary care paediatric hospital between 2000 - 2017, 73% female, mean age 13.7 years	N/A	• N/A	• Three specific sub-types identified: 1. Apparent lack of interest in eating 2. Restriction as a result of sensory sensitivity 3. Restriction based on fear of aversive consequences • Clinical characteristics of patients varied depending on assigned subtype • Some mixed presentations observed
Okereke (2018) USA (Treatment interventions)	To describe the successful treatment of anxiety using buspirone in an individual with ARFID	Case study 14-year-old female BMI 20.3kg/m_2 (58_{th} percentile)	Complaints of anxiety, abdominal pain and vomiting resulting in food restriction (later diagnosed with ARFID as well as irritable bowel syndrome)	• Individual and family therapy • Sertraline at 50mg/day (discontinued when patient experienced agitation and thoughts of suicide) • Buspirone 5mg twice daily increased to 7.5mg twice daily at 1 month follow up and 10mg twice daily at 6-month follow-up • Follow-up 1, 2, 4, 6, and 8-months post-treatment	• BMI at 8-month follow up was 22.0kg/m_2 (73_{rd} percentile) • SSRIs can be used to treat eating-related anxiety but may cause adverse side effects, particularly in children and adolescents • Buspirone successfully treated anxiety symptoms associated with eating (patient denied any significant side effects)
Pitt & Middleman (2018) USA (Clinical characteristics)	To describe the presentation and treatment of two cases of ARFID	Case series (1) 17-year-old female, height 172.5cm, weight 46.9kg (2) 13-year-old female, height 141.3cm, weight 24.80kg	(1) 12 episodes of vomiting with 36-hour period, dizziness, abdominal pain, denied difficulties with body image, picky eating habits since childhood (2) Long-standing malnutrition, persistent complaints of constipation and nausea, denied difficulties with body image, picky eating with poor weight gain since 6 months	• Both patients hospitalised for malnutrition • Nasogastric tube placement was used followed by nasojejunal • Individualised behaviour plans provided to reinforce oral nutritional consumption • Family therapy provided	• No information regarding patients' outcomes • Authors conclude that treatment for ARFID may need to address behavioural components that contribute to food restriction (compared to treatments which focus on body image disturbances)

Sharp et al. (2018) USA (Clinical characteristics)	To examine the clinical presentation of severe food selectivity in children with ASD	70 children (2-17 years) with ASD and severe food selectivity referred to an outpatient programme	Complete omission of one or more food groups or consumption of a narrow range of items (five or fewer)	N/A	• 67% omitted vegetables & 27% omitted fruits • 78% percent consumed a diet at risk for five or more nutritional inadequacies • Severe food selectivity was not associated with compromised growth or obesity
Spettigue, Norris, Santos & Obeid (2018) Canada (Treatment interventions)	To examine the efficacy of treating ARFID patients with modified FBT or psychopharmacological treatment	5 females and 1 male (10-14 years)	Various presentations including fear following choking incident, abdominal pain and nausea, problems concentrating and severe anxiety	• Family Based Therapy • Medication - olanzapine, fluoxetine and cyproheptadine • CBT	All six patients achieved their goal weight
Wassenaar, O'Melia & Mehler (2018) USA (Clinical characteristics)	To present the case of an individual with co-occurring ARFID, psychosis and Gitelman syndrome	Case study 27-year-old woman BMI 15.8 kg/m$_2$	• Patient experienced 20lbs weight loss in the last year by restricting portion sizes • History of anxiety as well as confusion and persecutory auditory and visual hallucinations	• Admittance to inpatient care for specialised ED treatment and nutritional rehabilitation • Medication included aripiprazole, gabapentin for anxiety and methocarbamol and tramadol for pain	• Patient discharged at a restored weight with a plan to see outpatient nephrology and continue aripiprazole • On clinical examination, patient was emotionally flat, had psychomotor restriction, poor eye contact, monotoned speech and did not engage with peers • Patient continued to meet calorie goals but remained resistant to food flexibility • Later diagnosed with Gitelman syndrome
Westfall, Mavrides & Coffey (2018) USA (Clinical characteristics)	To present the case of an individual with acute psychosis and ARFID driven by religious delusions	Case study 16-year-old male	Patient hospitalised for the third time for acute psychosis, refusal to eat or drink driven by religious delusions, failure to take care of personal hygiene, covert food purging and intermittent marijuana use	• Olanzapine 5mg daily for psychosis and weight gain • Patient discharged after several days but did not continue medication or attend follow-up appointments • Patient readmitted 15 months later and eventually transferred to paediatric medical unit for dehydration and nasogastric feeding • Trials of olanzapine, haloperidol, cyproheptadine, risperidone and megestrol acetate failed • Clozapine appeared to resolve acute psychosis and refusal to eat	The patient did well after discharge but was readmitted to paediatric medicine 2½ weeks later but when his clozapine ran out

Zucker et al. (2018) USA (Treatment interventions)	To present an acceptance-based interoceptive exposure treatment for young people with ARFID and demonstrate its success in treating a young girl with lifelong poor appetite	Case study 4-year-old female	• Patient had percutaneous endoscopic gastrostomy (PEG tube) since 14 months of age • Indifference to food, lack of awareness of hunger, difficulty adjusting to a change in routine	8 weekly sessions followed by 4 bi-monthly sessions of acceptance-based interoceptive exposure treatment - Feeling and Body Investigators (FBI)-ARFID Division (also mirtazapine for a month prior to exposure treatment)	• Patient no longer met criteria for ARFID • Notable improvement in capacity to cope with change, unknown internal sensations no longer viewed as a threat • Increase in quantity of food consumed and need for supplemental feeds reduced • PEG tube eventually removed
Bloomfield, Fischer, Clark & Dove (2019) USA (Treatment interventions)	To examine the use of teleconsultation in treating a patient with ARFID	Case study 8-year-old-male	Frequent refusal of non-preferred foods resulting in tantrum behaviour (whining, crying, gagging) upon sight or smell	• Parent teleconsultation (behavioural feeding intervention to increase food variety) • Follow-up 1- and 4-months post-treatment	• Increase in the frequency of bites of non-preferred foods
Dahlsgaard & Bodie (2019) USA (Treatment interventions)	To report the acceptability, feasibility and initial outcomes of the Picky Eaters Clinic	Pilot trial 21 children with a diagnosis of ARFID (4-11 years) and their parents	Picky eaters (eating less than 20 foods, difficulty socialising, refusal to eat non-preferred foods)	• 7 sessions (90 minutes each) of parent-led behavioural intervention • Follow-up 3-months post-treatment	• Reduction in picky eating and negative mealtime behaviours
Dumont et al. (2019) The Netherlands (Treatment interventions)	To test a new 4-week exposure-based CBT day treatment for adolescents with ARFID	Case series Patients referred to SeysCentra, a specialised treatment facility for children with feeding disorders (n = 11), 36% female, 10-18 years	Various presentations including anxiety-driven (phobia), lack of interest in food, driven by disgust or aversion	• Exposure based CBT treatment designed to address a variety of ARFID presentations (i.e., disgust sensitivity, distorted cognitions about the consequences of eating feared foods) • A non-concurrent multiple baseline design followed by 4-week CBT • Various measures taken at baseline and throughout including measurement of DSM-5 ARFID diagnosis, food neophobia, body weight and anxiety • Follow-up 3-months post-treatment	• At follow up, 10 of the 11 patients were at a healthy weight and had an age-adequate nutritional intake • For most, food neophobia scores decreased to a non-clinical range • Dysfunctional cognitions about food intake/eating and anxiety decreased • Tube feeding eliminated in 6 patients • All 11 patients demonstrated a more varied food repertoire • Demonstrates a CBT approach which has the potential to treat various issues which drive restrictive/avoidant eating behaviours in ARFID

Hadwiger, Middleman & Pitt (2019) USA (Clinical characteristics)	To highlight the relationship between ARFID and internet gaming disorder and to illustrate two clinical cases with both disorders	Case series (1) 17-year-old male, height 167cm, weight 43.4kg (2) 15-year-old male, height 180.4cm, weight 48.2kg	(1) Poor weight gain, frequent vomiting, emetophobia, disinterest in eating, excessive video gaming (4+ hours a day) (2) Weight loss, post-meal vomiting, restricted food interests, emetophobia, 1 hour or more daily exercise, excessive video gaming (4+ hours a day), orthostasis, bradycardia, feelings of anxiety and depression	• Hospitalisation in the Disorder Eating Programme for refeeding, placed on malnutrition protocol (including psychoeducation and individual and family therapy) • Interventions aimed at changing eating and faming behaviours	• Both patients achieved the minimum medical and psychological goals and were discharged to follow-up in outpatient clinic • Both patients maintained medical progress but returned to gaming behaviours once discharged
Lai, Chee & Kwok (2019) Singapore (Clinical characteristics)	To describe the clinical profile of patients diagnosed with ARFID	Case series Five males and three females (15-39 years) presenting to an ED treatment facility at Singapore General Hospital, diagnosed with ARFID between 2013 - 2016 Mean BMI 16.1kg/m2	• Heterogeneous presentation including severe food restriction, lack of interest in eating, anxiety with certain foods, emetophobia, nausea and vomiting • 7 participants displayed symptoms of ARFID in childhood/adolescence and one in adulthood • Comorbid major depressive disorder, ASD, deliberate self-harm, low mood, lethargy and cold intolerance	• Inpatient or outpatient treatment with multidisciplinary team • All patients completed nutritional rehabilitation with a dietician and two were referred to a psychologist	• Two patients reached a BMI within the healthy weight range after returning regularly for treatment • The remaining six patients defaulted follow-up appointments
Lange et al. (2019) Sweden (Clinical outcomes)	To compare the long-term outcomes of those with AN and low-weight ARFID	Retrospective chart review of consecutive patients diagnosed at a regional ED service in southern Sweden from 1983 - 2007 (n = 56) (n = 19 diagnosed retrospectively with ARFID), 95% female	N/A	• Follow up after a mean of 15.9 years	• Mean BMI for ARFID group 21.9 kg/m^2 (range 16.5–29.9; SD 3.33) • In the ARFID-group, 26.3% had a current ED, 26.3% had other psychiatric diagnoses (including anxiety and depression), and 47.4% had no psychiatric diagnosis • For the ARFID group, ED diagnoses at follow-up were all ARFID (possible symptomatic stability) whereas the AN group showed heterogeneity
Lieberman et al. (2019) Canada (Clinical characteristics)	To compare the medical and psychological characteristics of children with ARFID and AN	Comparative study Inpatient and outpatient participants in a specialised programme at the Hospital for Sick Children (n = 106), 8-13 years	• Patients meeting DSM-5 criteria for AN or ARFID • Criteria for inpatient admission - heart rate <50 BPM and/or treatment goal weight <80% • Criteria for outpatient acceptance - primary diagnosis of an ED and medical stability	• Inpatient or outpatient care at the Hospital for Sick Children	• Children with ARFID had a longer length of illness, history of abdominal pain and infections preceding diagnosis and more likely to be diagnosed with an anxiety disorder • Those with AN had a higher drive for thinness, lower self-esteem, scored higher on depression and

					were more likely to be admitted for inpatient care
Lock, Sadeh-Sharvit & L'Insalata (2019) USA (Treatment interventions)	To assess the feasibility of conducting an RCT comparing FBT-ARFID to usual care	Feasibility study 28 children (5-12 years) and their families	Patients meeting DSM-5 criteria for diagnosis of ARFID	• Participants randomised to receive immediate treatment with FBT for ARFID or usual care for a period of 3 months (and then offered FBT-ARFID) • Dose and duration of treatment were allowed to fluctuate according to clinical need	• Effect size differences on measures of weight and clinical severity of symptoms were moderate to large, favouring FBT-ARFID over usual care • Improvements also observed in parental self-efficacy • An RCT comparing FBT-ARFID and usual care would be feasible
Makhzoumi et al. (2019) USA (Clinical outcomes)	To assess weight restoration and discharge outcomes of patients with ARFID compared to those with AN	Retrospective chart review Consecutive underweight first admissions to an integrated hospital-based IP-PHP ED treatment programme between 2003 - 2017 (n = 275) (10% ARFID), 86% female, 11-26 years patients	• Various symptoms including fear of vomiting or choking, food restriction for avoidance of GI symptoms, reliance on parenteral/enteral tubes • Psychiatric comorbidities included major depression and anxiety disorders	The John Hopkins IP-PHP which employs a meal-based behavioural rapid refeeding protocol (including, dialectical–behavioural, cognitive-behavioural and family-based therapies)	• ARFID group had a slower weekly weight gain compared to those with AN • Both groups had similar programme discharge BMIs • No group differences found on IP length of stay or PHP rate of weight gain
Reilly et al. (2019) USA (Clinical characteristics)	To explore the potential co-occurrence of behavioural phenotypes in ARFID	Retrospective chart review ARFID patients presenting for treatment at a PHP between June 2014 and May 2018 (n = 59)	• 49% classified as underweight (<85% expected body weight) • Variety of psychiatric and medical comorbidities including ADHD, OCD and Crohn's Disease	N/A	• Over 50% endorsed symptoms characteristic of more than one proposed behavioural phenotype • Sensory sensitivity phenotype was most common and frequently co-occurred with both other phenotypes
Schorr et al. (2019) USA (Clinical characteristics)	To investigate bone mineral density and hip strength in men with AN, ATYP and ARFID	103 patients: AN (n = 26), ARFID (n = 11), ATYP (n = 18), healthy controls (n = 48), 100% male, 18-63 years	N/A	N/A	• Mean BMI was lowest in AN and ARFID, higher in ATYP and highest in healthy controls (AN 14.7 ± 1.8, ARFID 15.3 ± 1.5, ATYP 20.6 ± 2.0, HC 23.7 ± 3.3 kg/m_2) • Mean bone mineral density Z-scores at spine and hip were lower in AN and ARFID than healthy controls • Men with ARFID (as well as AN and ATYP) are at risk of low bone mineral density and those who are low weight, have low muscle

					mass or long illness duration may be at particularly high risk
Trompeter et al. (2019) Australia (Clinical characteristics)	To investigate whether fear of negative evaluation is associated with a greater chance of meeting criteria for an ED	Australian adolescents (n = 4,030) from the EveryBODY study (53% female)	• ARFID (n = 107), AN (n = 19), BN (n = 167) • Various other EDs including ATYP, BED and UFED • N = 2,985 classified as having no disorder	N/A	• Fear of negative evaluation was found to be associated with higher odds of meeting criteria for any ED but significantly more for those characterised by weight/shape concerns
Zickgraf, Lane-Loney, Essayli & Ornstein (2019a) USA (Clinical characteristics)	To identify potential ARFID presentations based on the nature of eating restriction	Retrospective chart review 83 patients (8-17 years) with ARFID admitted to a PHP (76% female)	• Selective eating behaviours based on sensory properties, lack of interest in eating/low appetite and fear of aversive consequences • Also, a subset of patients with both selectivity and limited interest/appetite	N/A	• Four primary presentations differed on core ARFID criteria, symptom trajectory, illness duration, mood, medical comorbidities, age, gender and parent-reported symptoms of psychopathology • Suggests that there are diagnostically meaningful ARFID subtypes
Zickgraf, Murray, Kratz & Franklin (2019b) USA (Clinical characteristics)	To describe the clinical characteristics of individuals diagnosed with the selective/neophobic presentation of ARFID	Retrospective chart review 22 consecutive outpatients (4-25 years) diagnosed at a university clinic between 2014 - 2017 (18.2% female)	• Patients with selective/neophobic ARFID presentation • Unwilling to try new/non-preferred foods • Rigid about preparation and presentation of food	N/A	• Results evidence a selective/neophobic ARFID presentation • All patients met criteria for psychosocial impairment

*Note. ARFID = avoidant/restrictive food intake disorder; ED = eating disorder; AN = anorexia nervosa; BN: bulimia nervosa; ASD = autism spectrum disorder; BMI = body mass index; ATYP = atypical anorexia; BED: binge eating disorder; UFED: unspecified feeding or eating disorder; CBT = cognitive-behavioural therapy; ChEAT = children's eating attitude test; RCMAS = revised children's manifest anxiety scale; CHOP = The Children's Hospital of Philadelphia; %MBMI = percent median body mass index