

A Study of Treatment Approaches for Children and Adolescents with Avoidant/Restrictive Food Intake Disorder

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Abstract. Eating disorders negatively affect people's health. Common eating disorders including binge eating disorder, anorexia, and bulimia nervosa which are widely researched by researchers. New eating disorder, avoidant/restrictive food intake disorder (ARFID) introduced in DSM-5 which received less attention from researchers and the public. The research presented that children and adolescents are disproportionally affected by ARFID, but currently, there is a lack of understanding of ARFID and its treatments. This systemic review extracts relevant studies from three databases to identify available treatments of ARFID and assess the efficacy of each treatment. It aims to bring the public's attention to ARFID, preventing delays in seeking healthcare services. Also, this review is designed to guide healthcare professionals for ARFID treatment selections as well as bringing suggestions for future research directions. Three databases (PubMed, Cochrane Library, Scopus) were searched from 2013–2023 for studies that relevant to treatments for children and adolescents with ARFID. 7 studies were included in this review. It reported that treatments for managing children and adolescents with ARFID in all 7 studies presented positive effects in the reduction of ARFID symptoms. The biggest limitation of the finding was the small sample size. The evidence showed that all different types of ARFID treatment had an improvement in ARFID symptoms. However, the definitive conclusion cannot be drawn before conducting research with an increased sample size. Children and adolescents' motivation for changing eating behaviours and parent education can partially determine the efficacy of treatments.

Keywords: Eating disorders; Avoidant/restrictive food intake disorder (ARFID); The Diagnostic and Statistical Manual of Mental Disorders; Fifth Edition (DSM-5).

1. Introduction

Eating disorders is a type of mental health condition defined by abnormal eating behaviours and uncommon thoughts and emotions toward food. Typical eating disorders such as binge eating disorder, anorexia, and bulimia nervosa which are introduced in the fourth edition of the Diagnostic and Statistical Manual of mental disorders (DSM-IV). Individuals diagnosed with any type of eating disorders within these three have a common characteristic which is extremely concern about weight, body shape, and feel dissatisfied with their appearance [1]. The publication of DSM-5 in 2013 improved diagnostic criteria of different types of eating disorders that were introduced in DSM-4 as well as introducing additional eating disorders. Avoidant/restrictive food intake disorder (ARFID) is one of the newly introduced eating disorders in DSM-5. It is characterised by excessive selective of food and a lack of enthusiasm for eating. ARFID usually does not involve paying extreme attention to weight control and body shape which are different from anorexia nervosa and bulimia nervosa. ARFID was used to be called selective eating disorder and substituted the previous term feeding disorder of infancy or early childhood. It was a term that described children aged under 6 years old including age 6. ARFID can be used by anyone with no age restriction. Although the diagnosis of ARFID does not have age restricted, ARFID is happened more in children and adolescents compared to adults. The study introduced epidemiology of ARFID, it represents that ARFID prevalence in children and adolescents can be up to 22.5% in a group of population with eating disorders while ARFID only affects 9.2 % of adults among people with eating disorders [2]. ARFID is not well known by the general population and the research of ARFID is very limited. Also, there are very limited data

for ARFID that can be used to compare the prevalence between different age groups. Therefore, the prevalence of ARFID might be underestimated and ARFID may affect more people in fact.

2. Eating Disorders on the Global Scale

The global prevalence of eating disorders increased from 1990 to 2017, as age-standardised rate of prevalence in 1990 was 172.53 (95%UI: 138.22-211.82) per 100 000 population compared to the prevalence in 2017 which was 203.20 (95%UI: 162.34-250.75) per 100 000 population. Additionally, Disability-adjusted life years (DALYs) were also appearing an increased trend from 2017 to 1990 worldwide. Females showed to have an overall higher prevalence and DALYs in a comparison to males regardless of the year change from 1990 to 2017 [3].

3. The Effect of COVID-19

COVID-19 pandemic started at the end of 2019 which affects people worldwide. The introduction of restriction policies preventing the spread of COVID-19 limited the treatment opportunities and cause the interruption of the treatment progress of individuals with eating disorders. It can potentially lead to an increase in the risk of exacerbating symptoms of eating disorders and developing new symptoms that are due to left untreated or delayed treatments. This may result in a negative long-term effect on patients' physical health and mental health, which ultimately lead to a further increase in the global burden [4].

Due to the increasing number of people affected by eating disorders and its greater global impact, it has received increasing attention. Many systemic reviews were conducted for identifying treatment types and evaluating treatment efficacy for different types of typical eating disorders which are familiar and well-known by healthcare professionals and the public for many years. However, there is an insufficient level of attention, limited understanding and little research conducted on the new emerging eating disorder, ARFID. As a result, this systemic review will focus on understanding the treatment efficacy for ARFID by identifying, summarising, and evaluating the current treatments for ARFID. This review provides people with a better understanding of ARFID, preventing overlooking of the ARFID symptoms, as it can mimic some eating behaviours that are usually present in children and adolescents. It allows parents to identify abnormal eating behaviours and seek timely medical advice and treatment, preventing the exacerbation of the symptoms. Moreover, the review provides a summary of the efficacy of different treatment options which intend to guide healthcare professionals to provide the best suitable treatment to children and adolescents with ARFID. Lastly, the review also highlights the potential future study and research direction for investigating AFRID.

4. Methods

4.1. Literature Search Strategy

The systemic review started from searching literature on PubMed, Cochrane Library, and Scopus. To prevent the inconsistency in the definition and diagnostic criteria of ARFID, the review only included studies published in 2013 to 2023. The search terms are based on three areas: treatments, avoidant/restrictive food intake disorder and age groups. Boolean operators (AND, OR) were used as conjunctions to combine the key terms in the article titles and abstract. The search strategy applied for literature search were (ARFID OR Avoidant/restrictive food intake disorder) AND (Children OR adolescents OR under age 18 OR youths OR Juniors OR teens OR teenagers) AND (treatments OR interventions OR health care OR services OR therapeutics).

4.2. Inclusion and Exclusion Criteria

4.2.1. Inclusion criteria

Year of publication between 2013 and 2023;

English language study;
Participants meet DSM-5 ARFID diagnostic criteria;
ARFID is the major diagnosis for participants;
Studies assess the efficacy/ feasibility of treatment for managing ARFID

4.2.2. Exclusion criteria

Study participants are non-human only;
Adult participants;
Participants age below 12 months;
Studies are still in progress;
ARFID-like symptoms associated with other diseases (e.g. ASD);
Studies only introduce the mechanism of ARFID treatments;
Meta-analysis

4.3. Study Selection

The review included most studies (6/7) involving humans as study participants and one study involved both humans and mice as study participants. The review excluded theoretical articles which do not involve direct studies and experiments for investigating ARFID treatments.

4.4. Data Extraction

Each included study for the review was screened and the following elements were extracted from each study: name, year of publication, reference, participant age range, sample size, treatment options for ARFID, and main findings. The characteristics from the included studies were presented in Table 1.

Table 1. Characteristics of studies

Author(s) name, year of publication, reference	Ages	Sample size	Treatments	Main findings
Sharp et al., 2016 [5]	12 months - 6 years	20	Integrated eating aversion treatment (iEAT)	High satisfaction and acceptability by participants.
Kapphahn et al., 2017 [6]	9-21 years	140	Hospitalization	Hospitalization helps low-weight patients to increase body mass index compared to non-hospitalization.
Sharp et al., 2017 [7]	18 months – 6 years	15	D-cycloserine (DCS)	DCS shows benefits in improving food aversion in children and mice.
Taylor et al., 2019 [8]	13 years	1	Home-based individualised, behaviourally treatment	100% food consumption and high acceptability of new food.
Dumont et al., 2019 [9]	10-18 years	11	Exposure based cognitive behavioural therapy	10 out of 11 participants gain a healthy weight with a good nutritional intake. Food neophobia, dysfunctional cognitions and anxiety level are decreased after the treatment.
Lock et al., 2019 [10]	5-12 years	28	Family-based treatment	ARFID-related symptoms were improved after involving parents to change eating behaviours.
Thomas et al., 2020 [11]	10-17 years	20	CBT-AR	Low weight participants had significant weight gain and all participants showed a reduced ARFID severity score.

5. Results

5.1. Selection of Papers

330 studies were identified based on the search strategy and 7 studies met the requirements and were included in the systemic review. The process of the study selection is shown below (Figure 1).

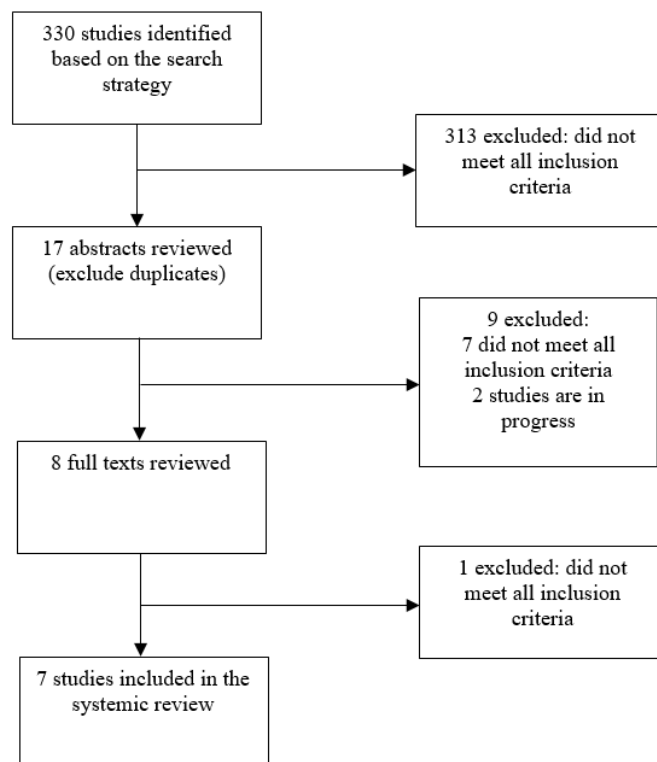


Fig 1. Study selection flowchart.

5.2. Year of Publication

The review intends to include studies published between 2013 and 2023, as ARFID was officially introduced in DSM-5 in 2013. Seven studies (Figure 2) were included in the systemic review with three studies published in 2019. Two studies were published in 2017. There is one study was published in 2016 and 2020 respectively.

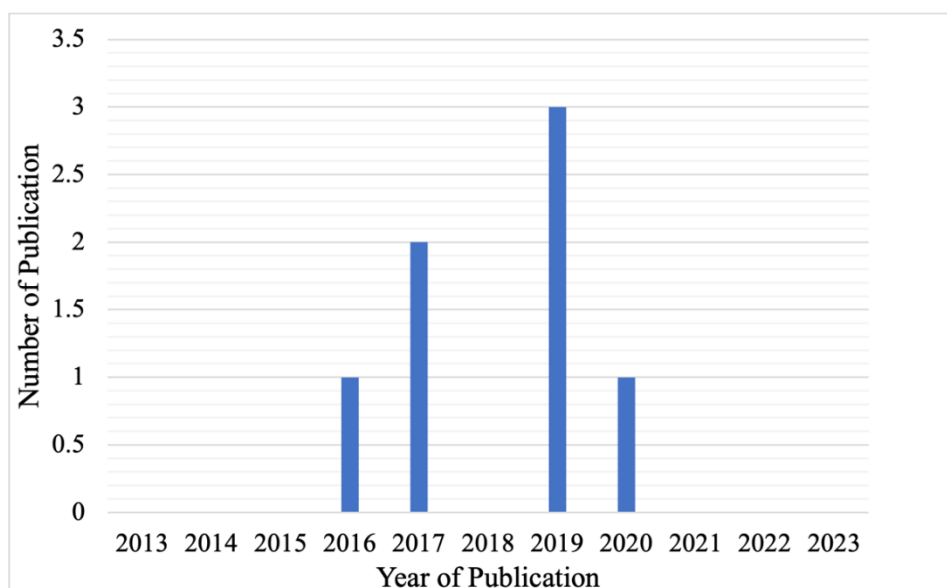


Fig. 2 Number of studies published between 2013-2023.

5.3. Population and Sample Size

Six studies included mixed samples (male and female) and one study only included one female participant. Most studies (4/7, 57%) were male, one study has an equal number of participants between male and female and one study has more female than male. The total of 235 participants were included in the review. Six studies have a sample size between 10-30 participants. One study only includes one participant, and one study has the largest sample size among all included studies which is 140 participants.

6. Discussion

Studies by Sharp et al. found that food consumption (0.5g vs. 34g in 10-minute meal observation) is significantly increased after introducing meal plans as the treatment for ARFID [5]. A result of a retrospective chart review from Kapphahn et al. showed that adolescents who were hospitalised with <85% Median BMI have four times higher chance to gain at least 90% Median BMI compared to those who were not hospitalised [6]. Sharp et al.'s randomised, double-blind, placebo-controlled study demonstrates that the behavioural intervention (BI) + DCS intervention group increases in feeding (37% vs. 76%) and reduces in food aversion compared to the BI control group [7]. This study also conducts a cross-species neuronal remodelling which showed a positive effect on reducing food aversion in mice. Home-based individualised, behaviourally treatment conducted by Taylor et al. presents that the participant consumed 100% of food and was able to eat more different types of food (7 types to 61 types) without inappropriate behaviours during the mealtime. Also, caregivers reported high satisfaction (4.82 out of 5) after the treatment [8]. Dumont et al.'s study utilised exposure based cognitive behavioural therapy and the result presented the continued reduction of the food neophobia scale from the baseline data to post-treatment as well as during the follow-up period. 91% of participants gain a healthy weight with appropriate nutrition intake based on their age [9]. A randomised clinical trial by Lock et al. demonstrated that PARDI assessment showed a larger improved score for participants in the FBT-ARFID intervention group than those in the usual care control group. The assessment (PARDI severity subscale score: usual care 3.15 vs. 2.75, FBT-ARFID 3.26 vs. 1.79; PARDI sensory subscale score: usual care 2.19 vs. 1.72, FBT-ARFID 1.67 vs. 1.07; PARDI LoI subscale score: usual care 2.45 vs. 2.18, FBT-ARFID 2.79 vs. 2.18; PARDI fear subscale score: usual care 0.49 vs. 0.40, FBT-ARFID 1.45 vs. 0.48) [10]. Thomas et al.'s study conducts a CBT-AR and the overall severity scale of ARFID reduced from 2.8 to 1.8 and the mean weight increased from 84.1 pounds to 95.6 pounds after the treatment [11].

7. Conclusion

Although all studies present an improved ARFID symptoms using different types of treatment, the sample size for each treatment is relatively small. 5 studies addressed the small size as the limitation in their studies and expressed the need for a large-scale sample size to generate a definitive conclusion and further prove the efficacy of treatments. All types of treatment involve parents or caregivers at some stage to deliver the treatment for improving their children's eating behaviours. As a result, parents with a clear instructions and education from researchers are important indicators for determining the success of the treatments and sustaining the outcome. Furthermore, participants with ARFID express the desire for changing eating behaviours is also a crucial indicator for conducting successful treatments. It is difficult to implement the treatment when participants are resistant to making changes to their eating habits. Therefore, there are many uncontrollable and unmanageable factors that may interfere with the result of the treatments.

Testing parent knowledge and behaviours would be useful in the future for knowing whether the intended treatment had been correctly implemented. Future research requires a more randomised controlled trial and a large scale to improve the generalizability of the findings. It allows the result to be applied to a broader context and improves the level of accuracy as well as increasing the reliability

of the study results. It enables to implement evidence-based practice and help children and adolescents with ARFID to achieve better health outcome.

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