Treatment of avoidant/restrictive food intake disorder in a cohort of young patients in a partial hospitalization program for eating disorders

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Abstract

Objective: Avoidant/restrictive food intake disorder (ARFID) is a recently named condition to classify patients who present with restricted nutritional intake without body image distortion or fear of weight gain. We sought to compare treatment outcomes of patients with ARFID in a family-centered partial hospital program (PHP) to those with other eating disorders (ED).

Method: A retrospective chart review of 130 patients 7–17 years of age admitted to the program from 2008 to 2012 was performed. Intake and discharge data included: length of stay; percentage median body mass index (%MBMI); and scores on the Children’s Eating Attitudes Test (ChEAT) and Revised Children’s Manifest Anxiety Scale (RCMAS). Between and within group effects were measured for intake and discharge data.

Results: Patients with ARFID spent significantly fewer weeks in program than those with anorexia nervosa (AN) and experienced a similar increase in %MBMI as patients with AN and other specified/unspecified feeding and eating disorders. All patients exhibited significant improvements in psychopathology over the course of treatment as measured by scores on the ChEAT and RCMAS.

Discussion: Our findings suggest that patients with ARFID can be successfully treated in the same PHP as patients with other ED, with comparable improvements in weight and psychopathology over a shorter time period. Results are limited to patients with ARFID who exhibit an acute onset of severe food restriction. Future research should incorporate measures relevant to the diagnosis of ARFID and explore how patients with different ARFID subtypes may respond to various treatments.

Keywords
avoidant restrictive food intake disorder, children and adolescents, partial hospital program, treatment outcomes

1 | INTRODUCTION

Avoidant/restrictive food intake disorder (ARFID) is a recently named eating disorder (ED) diagnosis in the 5th Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013) and represents one of the most substantial revisions to the Feeding and Eating Disorders section. The disorder is characterized by avoidance or restriction of food resulting in one or more of the following: weight loss or failure to gain expected weight during a period of growth, macro- or micro-nutrient deficiencies, dependence on oral or enteral nutritional supplements, and significant impairment in psychosocial functioning. There is no fear of weight gain or body image disturbance, and symptoms cannot be fully explained by another medical or psychiatric disorder; however, another disorder can coexist with ARFID, as long as the severity of the latter exceeds what is typically seen and requires distinct clinical attention. Although research has
yet to establish distinct subgroups within ARFID, the DSM-5 provides
commonly encountered clinical examples, including: individuals who do
not eat enough and show little interest in eating; individuals who
avoid foods with certain sensory features; and individuals who refuse
foods due to fear of choking or vomiting (American Psychiatric Associa-

Early studies of ARFID largely describe prevalence and characteris-
tics of patients diagnosed with the disorder. In a large sample of 8- to
13-year-old children in Switzerland, 3.2% reported symptoms consis-
tent with a diagnosis of ARFID based on the Eating Disturbances in
Youth-Questionnaire (EDY-Q) (Kurz, Van Dyck, Dremmel, Munsch, &
Hilbert, 2015). Prevalence of ARFID in patients presenting to tertiary
care pediatric hospitals in North America, including those who received
services at a large, multicenter group of Adolescent Medicine Eating
Disorders programs, range from 5% to 14% (Fisher et al., 2014; Norris
et al., 2014), while a higher prevalence (23%) was found in young
patients admitted to a partial hospitalization program (PHP) for ED
(Nicely, Lane-Loney, Masciulli, Hollenbeak, & Ornstein, 2014). The low-
est prevalence (1.5%) was found in patients presenting to a large pedi-
atrict gastroenterology healthcare network (Eddy et al., 2015). Patients
with ARFID are generally younger, more likely to be male, and fre-
quently as malnourished as those with other restrictive ED (Eddy et al.,
2015; Fisher et al., 2014; Nicely et al., 2014; Norris et al., 2014).

To our knowledge, there are few treatment studies of ARFID to
date. Prior to the publication of the DSM-5, various modalities have
been utilized for patients who would have likely met criteria for ARFID
(e.g., selective eating, functional dysphagia, choking phobia, food avoid-
ance), including in vivo exposure and cognitive–behavioral interven-
tions (Chorpita, Vitali, & Barlow, 1997; Nicholls, Christie, Randall, &
Lask, 2001), as well as individualized approaches to family therapy
(Murray, Thornton, & Wallis, 2013; Rhodes, Prunty, & Madden, 2009).

In addition, the feeding disorders literature, which is replete with
mostly nonrandomized studies in younger patients, supports the use of
behavioral treatment with the inclusion of nutrition management
(Lukens & Silverman, 2014). Research also suggests that children with
severe feeding disturbances benefit most from intensive, multidisci-
plinary treatment (Sharp, Volkert, Schall, McCracken, & McElhanon,
2016). Case reports focusing specifically on ARFID since the publica-
tion of the DSM-5 have described treatment using behavioral parent-
training and cognitive–behavioral therapy (Fischer, Luiselli, & Dove,
2015; King, Urbach, & Stewart, 2015; Murphy & Zlomke, 2016). Given
that no large-scale research study has been conducted to date, inter-
ventions that have been successful for individuals with ARFID may
provide a useful foundation for treatment. Moreover, degree of malnu-
rition, presence of associated medical symptoms, comorbid psychopa-
thology, family functioning, and the patient’s beliefs about food are all
important in the determination of the treatment approach and level of
care warranted. One recent study examined the presentation and treat-
ment course of patients with ARFID who were briefly hospitalized on a
medical unit. While they required enteral nutrition more frequently and
had a longer length of stay than those with AN, remission and readmis-
sion rates at one year were similar in AN and ARFID (Strandjord, Sieke,
Richmond, & Rome, 2015).

We have previously reported on the prevalence and characteristics
of a cohort of young ED patients admitted to a PHP, almost a quarter
of whom were diagnosed with ARFID (Nicely et al., 2014). Due to the
paucity of literature on ARFID, we sought to compare treatment out-
comes of young patients with ARFID admitted to our PHP for ED to
those with AN, bulimia nervosa (BN), and other specified feeding or
eating disorder/unspecified feeding or eating disorder (OSFED/UFED)
in the same cohort. To our knowledge, this is the first study to look at
a cohort of youth with ARFID undergoing intensive ED treatment.

2 | METHOD

2.1 | Participants and procedures

A retrospective chart review was performed on 177 patients admitted
to a PHP for children and adolescents with ED between August 4,
2008 and May 1, 2012. This PHP accepts girls and boys between the
ages of 7 and 17 years. In addition to typical ED, our PHP treats
patients with ARFID who exhibit an acute onset of severe food restric-
tion that results in significant weight loss or failure to gain weight.
Most patients with ARFID treated in our clinic present with low body
weight and restrict their intake in an effort to avoid certain feared out-
comes (e.g., choking, vomiting, gastrointestinal discomfort) or due to
disgust toward food. While a number of patients with ARFID treated in
the PHP also experience sensory and texture issues with food, symp-
toms of autism spectrum disorder, and/or longstanding picky eating,
patients who do not also exhibit an acute onset of more severe food
restriction leading to low body weight are typically referred to the
Feeding Disorders Program at our institution.

Upon admission to the PHP, initial evaluations were conducted by
a trained Child and Adolescent psychiatrist, an experienced clinical psy-
chologist or licensed social worker, an Adolescent Medicine physician,
and a dietitian, all of whom specialize in the care of patients with ED.
These evaluations were used to generate ED and concurrent psychiat-
ric diagnoses using DSM-IV-TR criteria. At the time of chart review,
DSM-5 ED diagnoses were determined using a checklist based on the
proposed DSM-5 diagnostic criteria for ED (which were the same as
the published criteria other than subtle wording differences) and
agreed upon together through careful discussion by two of the psychi-
atric specialists and an adolescent medicine physician. Details regarding
food avoidance and/or restriction were extrapolated from the multiple
initial evaluations that were performed, although no formal screening
measures were utilized at the time of admission.

Of the 177 initial patients who were admitted to the PHP, 11
were excluded from the present analyses: six patients who left the pro-
gram against medical advice within the first two weeks of treatment; two
who had medical conditions that were retrospectively determined
to fully account for their disordered eating behaviors; two who
received a diagnosis of binge eating disorder, which comprised too
small a distinct group for data analysis; and one who transitioned from
inpatient care for a few days before being discharged to outpatient
care. Of the remaining 166 patients, 36 (22%) were transferred from
the PHP to a higher level of care at some point during treatment. The
other 130 (78%) patients (i.e., “treatment completers”) participated in the PHP until they were discharged from the program, typically to outpatient care.

This study was approved by the Institutional Review Board of the Penn State Hershey Medical Center/College of Medicine.

### 2.2 Treatment

Treatment was initiated at a partial level of care—a 5 days per week for eight-and-a-half hours per day—and included a daily 2-hour school component. As patients improved, they typically attended the program for fewer days per week. This allowed patients to progressively transition back into their school and other social environments before being discharged from the program.

Treatment in the PHP incorporated aspects of family based therapy (Lock & Grange, 2015), behavioral management (Attia & Walsh, 2009; Steinglass, Mayer, & Attia, 2015), cognitive behavioral therapy (Fairburn, 2008; Garner, Vitousek, & Pike, 1997; Waller et al., 2007), and exposure and response prevention (Steinglass et al., 2014) for ED. Elements from these approaches were individualized to treat each patient with ARFID and other ED. Exposure therapy was conceptualized broadly by targeting foods that patients avoided due to idiosyncratic fears, worries, or disgust. The treatment team worked collaboratively with participants and their families to identify avoided foods, explore beliefs about eating these foods, facilitate the reintroduction of these foods in program and at home in a generally hierarchi-
cal manner, and discuss the accuracy of food-related predictions. Almost all participants with ARFID who did not report specific eating fears expressed disgust and/or negative beliefs about eating, which we found consistent with a flexible application of exposure and cognitive therapy.

Parents and/or other family members participated in multiple aspects of treatment, including weekly family therapy, daily multifamily group breakfast meals, weekly groups geared toward weekend plan-
ing, and the patients’ individual appointments with adolescent medi-
cine, a psychiatrist, and a dietitian. Patients and parents were given a meal plan to promote weight restoration, and exposures targeting avoided foods were completed daily in program and throughout the week at home. Particularly when families struggled to support their child with eating at home, they were assisted in learning behavioral management strategies such as providing rewards (e.g., access to a fun activity) to their child for achieving treatment goals (e.g., eating a feared meal). In addition to family therapy sessions, patients attended weekly individual therapy sessions and a variety of therapy groups, with topics including cognitive restructuring, goal setting, coping skills, and motivation for recovery. Patients also participated in a weekly expressive arts group that aimed to enhance these other treatment approaches in a developmentally appropriate way. The program included two supervised meals (breakfast and lunch) and two snacks during the day. Psychotropic medications were initiated or continued at the discretion of the child and adolescent psychiatrist, based on ED symptoms and psychiatric co-morbidities. For patients with attention-deficit/hyperactivity disorder (ADHD), stimulants were often discontinued and/or switched to a medication with less appetite suppression.

### 2.3 Measures

#### 2.3.1 Baseline demographics, patient history, and clinical features

Intake data included age, gender, ethnicity, and percent median body mass index (%MBMI). Initial evaluations provided information on past history of ED and/or other mental health treatment, use of psychiatric medication, percentage of body weight lost, and length of illness.

#### 2.3.2 Anthropometrics

Weight and height were measured by staff at initial presentation and discharge. BMI was calculated using the standard formula \(\text{BMI} = \frac{\text{weight} (\text{kg})}{\text{height}^2 (\text{m})}\) and the %MBMI was determined based on the 50th percentile BMI-for-age using the 2000 Centers for Disease Control and Prevention growth charts (www.cdc.gov/growthcharts).

#### 2.3.3 Psychometric measures

The following measures were administered to patients at intake and discharge.

*The Children’s Eating Attitudes Test (ChEAT) (Maloney, McGuire, & Daniels, 1988)*. The ChEAT is a 26-item scale assessing attitudes and behaviors associated with food and eating, validated in patients as young as 8 years old, adapted from the original EAT-26 (Garner, Olmsted, Bohr, & Garfinkel, 1982). A score of 20 or greater is considered clinically significant relative to the normative population. The three subscales reflect varying types of eating pathology and include: Dieting, Bulimia/Food Preoccupation, and Oral Control (Garner et al., 1982).

*Revised Children’s Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 1985)*. The RCMAS is a 37-item self-report instrument designed to measure anxiety for children and adolescents ages 6–17 years. The measure yields a Total Anxiety Score that is expressed as a T-score \((M = 50, SD = 10)\). The three factor-based subscales are also converted to scaled scores \((M = 10, SD = 3)\): Physiological Anxiety, Worry/Oversensitivity, and Social Concerns/Concentration (Reynolds & Paget, 1983).

#### 2.4 Data analysis

\(\chi^2\) tests using our larger sample of 166 patients explored whether diagnostic groups differed with regards to transfer to a higher level of care. All other analyses focused on the 130 treatment completers. Descriptive statistics, \(\chi^2\), and independent sample t tests investigated characteristics of patients with ARFID, AN, BN, and OSFED/UFED at intake (see Table 1). \(\chi^2\) tests also examined differences among diagnostic groups with regards to use of psychiatric medication. One-way analysis of variance (ANOVA) compared the number of weeks that patients from each diagnostic group spent in the PHP. Additionally, a series of mixed \(2 \times 4\) ANOVAs explored main effects for treatment (from intake to discharge), main effects for diagnosis (among ARFID, AN, BN, and OSFED/UFED), and interactions between treatment and diagnosis. Outcome variables included %MBMI and ChEAT and RCMAS scores.
TABLE 1 Mean scores, standard deviations, percentages, and p-values from one-way ANOVA and χ² tests exploring clinical characteristics of patients by DSM-5 eating and feeding disorder diagnosis at intake

<table>
<thead>
<tr>
<th>Clinical characteristic</th>
<th>ARFID (n=32)</th>
<th>AN (n=68)</th>
<th>BN (n=15)</th>
<th>OSFED/UFED (n=15)</th>
<th>F or χ² values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>11.06 (1.91)</td>
<td>14.11 (1.34)</td>
<td>15.08 (1.04)</td>
<td>14.59 (1.29)</td>
<td>34.86***</td>
</tr>
<tr>
<td>% MBMI</td>
<td>86.21 (9.96)</td>
<td>82.85 (8.00)</td>
<td>110.69 (21.05)</td>
<td>93.35 (7.23)</td>
<td>27.99***</td>
</tr>
<tr>
<td>% Body weight loss</td>
<td>9.84 (8.08)</td>
<td>17.71 (9.29)</td>
<td>5.48 (6.45)</td>
<td>14.41 (7.20)</td>
<td>7.92***</td>
</tr>
<tr>
<td>Length of illness (months)</td>
<td>10.08 (14.24)</td>
<td>9.14 (7.81)</td>
<td>15.67 (10.05)</td>
<td>10.20 (4.38)</td>
<td>0.80</td>
</tr>
<tr>
<td>Gender (% Female)</td>
<td>81.3</td>
<td>97.1</td>
<td>100</td>
<td>86.7</td>
<td>10.06*</td>
</tr>
<tr>
<td>Ethnicity (% Caucasian)</td>
<td>93.8</td>
<td>94.1</td>
<td>93.3</td>
<td>100</td>
<td>12.71</td>
</tr>
<tr>
<td>% SSRI</td>
<td>37.5</td>
<td>29.4</td>
<td>60.0</td>
<td>33.3</td>
<td>5.13</td>
</tr>
<tr>
<td>% Atypical antipsychotic</td>
<td>3.1</td>
<td>2.9</td>
<td>6.7</td>
<td>6.7</td>
<td>0.84</td>
</tr>
<tr>
<td>% ADHD medication</td>
<td>12.5</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>12.64**</td>
</tr>
<tr>
<td>% Other psych medication</td>
<td>3.1</td>
<td>1.5</td>
<td>13.3</td>
<td>0.00</td>
<td>6.36</td>
</tr>
</tbody>
</table>

Note. % MBMI = percentage median body mass index; SSRI = selective serotonin reuptake inhibitor; ADHD = attention-deficit/hyperactivity disorder; ARFID = avoidant/restrictive food intake disorder; AN = anorexia nervosa; BN = bulimia nervosa; OSFED/UFED = other specified feeding or eating disorder/unspecified feeding or eating disorder. Means with different superscripts differ significantly from each other (e.g., ARFID patients were significantly younger than patients with AN, BN, and OSFED/UFED). *p < .05, **p < .01, ***p < .001.

3 | RESULTS

3.1 | Baseline characteristics

Table 1 presents clinical characteristics of the 130 treatment completers at intake by ED diagnosis. Our sample was 92.3% female with a mean age of 13.53 ± 2.05 years (range 7.20–16.86); 32 (24.6%) met DSM-5 criteria for ARFID, 68 (52.3%) for AN, 15 (11.5%) for BN, and 15 (11.5%) for OSFED/UFED. The racial/ethnic breakdown of the sample was 94.6% Caucasian, 0.8% African-American, 0.8% Asian-American, and 3.8% other and/or mixed race/ethnicity. The mean %MBMI of the sample was 88.10 ± 13.74 (range 61.83–156.22). On average, patients had lost 14.21 ± 9.51% (range 0.00–49.20) of their body weight prior to initiating treatment with an illness length of 10.25 ± 9.87 months (range 0.50–60.00). As noted in Table 1, patients with ARFID had a higher preponderance of boys than other ED, were younger than patients with other ED, presented at a similar %MBMI to patients with AN, lost a smaller percentage of their pre-morbid weight, and were more likely to be taking medication for ADHD.

3.2 | Transfer to higher level of care

Although a smaller percentage of patients with ARFID (15.8%) were transferred to an inpatient unit during the course of treatment relative to those with AN (22.7%), BN (21.1%), and OSFED/UFED (28.6%), this difference was not statistically significant, χ²(3) = 1.43, p = .70. Patients who were discharged to a higher level of care had lost a significantly greater percentage of their body weight prior to starting treatment at the PHP (19.46% ± 13.46%) than did treatment completers (14.21% ± 9.51%), t(158) = 2.62, p < .01. These two groups did not significantly differ with regards to age, gender, %MBMI at intake, length of illness, or intake scores on the ChEAT or RCMAS.

3.3 | Treatment course and outcomes

3.3.1 | Length of stay

As illustrated in Figure 1, the four ED diagnostic groups had significantly different lengths of stay in the program, F(3, 126) = 12.42, p < .001. Patients with ARFID had a significantly shorter length of stay than those with AN (7.03 ± 3.38 weeks vs. 11.94 ± 4.21 weeks, p < .001), but not BN (8.87 ± 3.62 weeks, p = .44) or OSFED/UFED (9.20 ± 3.67 weeks, p = .29).

3.3.2 | Psychiatric medication

Over the course of treatment, 74.6% of patients were taking selective-serotonin reuptake inhibitors (SSRIs), 18.5% were taking atypical antipsychotics, 3.8% were taking ADHD medication, and 3.1% were taking other psychiatric medications. The four diagnostic groups did not significantly differ with respect to prescription of SSRIs, χ²(3) = 3.33, p = .34, or atypical antipsychotics, χ²(3) = 1.01, p = .80, during treatment. Patients with ARFID were more likely to be on medication for ADHD, χ²(3) = 15.93, p < .01.

3.3.3 | Percent median BMI

As noted in Table 2, the four diagnostic groups attained different %MBMI over the course of treatment, yielding a significant treatment
ARFID did not differ significantly from patients with AN (feeding or eating disorder; UFED = other specified feeding or eating disorder/unspecified feeding or eating disorder).

\[ \text{Note} \]

TABLE 2

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>ARFID ( (n = 32) )</th>
<th>AN ( (n = 68) )</th>
<th>BN ( (n = 15) )</th>
<th>OSFED/UFED ( (n = 15) )</th>
<th>F ( (\eta^2_p) )</th>
<th>Treatment</th>
<th>Diagnosis</th>
<th>Treatment ( \times ) diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>% MBMI</td>
<td>86.21 (9.96)</td>
<td>95.45 (7.96)</td>
<td>95.24 (5.47)</td>
<td>110.69 (21.05)</td>
<td>110.79 (17.38)</td>
<td>93.35 (7.23)</td>
<td>98.35 (5.21)</td>
<td>83.15*** (0.40)</td>
</tr>
<tr>
<td>ChEAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14.18 (12.78)</td>
<td>9.76 (10.51)</td>
<td>11.56 (10.52)</td>
<td>13.92 (13.01)</td>
<td>13.92 (13.91)</td>
<td>25.00 (18.57)</td>
<td>14.00 (12.02)</td>
<td>84.19*** (0.43)</td>
</tr>
<tr>
<td>Dieting</td>
<td>4.25 (6.84)</td>
<td>3.10 (6.76)</td>
<td>6.47 (7.07)</td>
<td>8.85 (8.10)</td>
<td>8.85 (8.10)</td>
<td>12.73 (11.82)</td>
<td>7.27 (7.72)</td>
<td>55.84*** (0.33)</td>
</tr>
<tr>
<td>Bulimia</td>
<td>2.64 (3.19)</td>
<td>1.71 (2.24)</td>
<td>1.53 (2.32)</td>
<td>1.85 (2.48)</td>
<td>1.85 (2.48)</td>
<td>5.07 (3.86)</td>
<td>2.73 (2.66)</td>
<td>87.74*** (0.44)</td>
</tr>
<tr>
<td>Oral control</td>
<td>7.07 (4.46)</td>
<td>5.07 (3.70)</td>
<td>9.26 (4.92)</td>
<td>6.62 (5.33)</td>
<td>6.62 (5.33)</td>
<td>7.87 (6.64)</td>
<td>4.00 (3.30)</td>
<td>54.21*** (0.32)</td>
</tr>
<tr>
<td>RCMAS</td>
<td>53.18 (10.69)</td>
<td>48.68 (11.63)</td>
<td>56.48 (11.82)</td>
<td>60.46 (10.11)</td>
<td>52.31 (12.79)</td>
<td>58.36 (15.13)</td>
<td>54.36 (14.03)</td>
<td>19.99*** (0.15)</td>
</tr>
</tbody>
</table>

Note: % MBMI = percentage median body mass index; ChEAT = Children’s Eating Attitudes Test; RCMAS = Revised Children’s Manifest Anxiety Scale; ARFID = avoidant/restrictive food intake disorder; AN = anorexia nervosa; BN = bulimia nervosa; OSFED/UFED = other specified feeding or eating disorder/unspecified feeding or eating disorder.

\[ p < .05, \quad **p < .01, \quad ***p < .001. \]
intake to discharge on these two subscales relative to patients with other ED diagnoses, which is likely responsible for the significant treatment × diagnosis interactions.

Of the three ChEAT subscales, Oral Control was the only one that demonstrated no between-groups differences at intake. $F(3, 114) = 1.78, p = .16$. While there was no significant main effect for diagnosis on this subscale, a significant main effect for treatment and treatment × diagnosis interactions were found (see Table 2). This interaction is likely due to the greater reduction on this subscale in patients with AN and OSFED/UFED relative to those with ARFID and BN.

### 3.3.6 RCMAS

As noted in Table 2, a significant main effect for treatment was found on the RCMAS, as scores improved for all subjects from intake to discharge. There was no significant main effect for diagnosis and no significant time × diagnosis interaction. The same pattern of results emerged on the Physical Anxiety, Worry/Oversensitivity, and Social Concerns/Concentration subscales of the RCMAS.

### 4 DISCUSSION

To our knowledge, this is the first study to explore the outcomes of children and adolescents with ARFID treated in a PHP. At baseline, patients with ARFID were as malnourished as patients with AN, and gained a similar amount of weight over the course of treatment, achieving about 96% MBMI, consistent with "good" weight restoration standards for adolescents with AN (Couturier & Lock, 2006). Moreover, patients with ARFID exhibited weight restoration in a shorter period of time than patients with AN, and were no more likely to be discharged to a higher level of care than those with other ED. These results diverge from prior research indicating that youth with ARFID were less likely to gain weight (Forman et al., 2014) and required longer hospitalizations and more enteral nutrition (Strandjord et al., 2015) than patients with AN. The poorer response to treatment observed in individuals with ARFID in these studies may be related to ARFID patients receiving insufficient treatment relative to those with other ED, as it appears that patients with ARFID are less likely to be followed up over time (Forman et al., 2014). Further research is warranted to explore whether ARFID patients in other treatment centers also complete program requirements in fewer weeks than those with AN.

In addition to weight gain, patients with ARFID and AN exhibited similar improvements on measures of food restriction and anxiety. While patients with other ED typically improved to a greater extent than patients with ARFID on ED symptoms based on the ChEAT, this pattern appears to be related to the low intake scores of those with ARFID. Notably, patients with ARFID had similar Oral Control scores as other ED patients. Unlike the Dieting and Bulimia/Food Preoccupation subscales of the ChEAT, the Oral Control subscale captures food restriction that is unrelated to a drive for thinness or purging, and includes items such as "I feel that others would like me to eat more" and "I take longer than others to eat my meals." On the other hand, studies have produced inconsistent findings when investigating the factor structure of the ChEAT (Anton et al., 2006), and the Oral Control subscale should not be interpreted as a valid stand-alone measure. While reductions on the ChEAT exhibited by participants with ARFID may not indicate any relevant improvement in eating-related psychopathology, it does suggest that these individuals did not develop ED behaviors while in the PHP, which is a concern that some providers have expressed about treating patients with ARFID and other ED in the same program.

The improvements exhibited by patients with ARFID provide promising preliminary support for the effectiveness of our treatment program for ARFID. Despite important differences between ARFID and other ED diagnoses, our findings suggest that these diagnostically diverse patients can be treated successfully in the same PHP. These results are encouraging given that ARFID patients are being referred to ED treatment centers (Forman et al., 2014; Ornstein et al., 2013). Many ED programs already have the staff and resources necessary to facilitate weight restoration and address the medical complications of malnutrition, and may want to consider how to modify their treatment approach to adequately address the specific clinical features of patients with ARFID.

Our program’s flexible use of interventions from a range of evidence-based treatments may provide some guidance as to how to treat certain patients with ARFID. Although the majority of patients in our PHP experience the same treatment format and are included in the same psychotherapy groups, interventions are individualized to the specific features of each patient. For example, we find that we are more likely to encourage parents to use behavioral interventions such as structured rewards contingent on their child eating certain foods for ARFID patients, although it is not uncommon for us to recommend similar behavioral interventions for patients with other ED. All patients are expected to eat foods they avoid over the course of treatment, but the specific foods that are targeted in exposure therapy and included in meal plans vary according to the specific concerns of each patient (e.g., fear of weight gain, fear of choking, avoidance of foods with certain textures).

The present study had a number of limitations that need to be considered when interpreting our findings. Perhaps most importantly, our study did not include follow-up after patients were discharged. Consequently, we cannot make conclusions about the longer-term effectiveness of our program for patients with ARFID or other ED. It may be the case that patients with ARFID or other ED relapse at different rates, which remains an important question that should be addressed by future research. We also did not have a control condition, and thus cannot conclude whether patients in our study would have performed any better or worse than individuals who were receiving no treatment or an alternative treatment. Additionally, we did not investigate the extent to which specific components of our treatment program were effective.

Although ARFID is a newer diagnosis, it encompasses the prior feeding disorders as well as many cases that met criteria for EDNOS. At the time of treatment in our study, there were no formalized assessment tools for ARFID, and this is a clear limitation. While measures
that have recently been used to screen for ARFID (Dovey, Aldridge, Martin, Wilken, & Meyer, 2016) were available at the time of our study, such as the Behavioral Pediatrics Feeding Assessment Scale (Crist & Napier-Phillips, 2001) and the Child Food Neophobia Scale (Pliner, 1994), these measures were designed for younger children and appeared less germane to our relatively older patient population. The development of reliable and valid assessment measures for older children with ARFID who present with symptoms other than selective eating is clearly warranted. Future research should consider using measures that have undergone psychometric testing and capture a wider range of ARFID symptoms such as the EDY-Q (Hilbert & van Dyck, 2016), which was not available at the time of our study.

Despite an adequate sample size of patients with AN and ARFID, we had a smaller number of patients with BN and OSFED/UFED, which may have attenuated results from analyses investigating these two groups. Although detailed discussion among experienced clinicians familiar with the cases informed the decisions for the appropriate DSM-5 diagnosis for each patient, there was no direct assessment of inter-rater reliability. Also, treatment in a PHP may suggest that patients have either a more or less severe degree of illness than patients seen in other settings. Hence, our findings may not generalize to patients in different treatment settings. Moreover, our results should only be considered generalizable to the type of patients with ARFID included in our sample: children who exhibit an acute onset of severe food restriction resulting in weight loss or failure to gain expected weight. Although a number of our participants had longstanding issues related to picky eating, it is unclear how patients without an acute onset of worsening food refusal would respond to our treatment program. We also did not investigate differences in outcomes between different ARFID presentations. It should be noted that, despite different proposals of ARFID subtypes (e.g., American Psychiatric Association, 2013; Eddy et al., 2015; Fisher et al., 2014), research has yet to provide empirical support for subgroups. We hypothesize that distinct subtypes do indeed exist within this heterogeneous diagnostic category, but also observe substantial overlap between proposed subgroups that warrant consideration in future research.

Notwithstanding these limitations, this study provides important preliminary information about the treatment outcomes of ARFID in a family-centered PHP with other ED patients. Our results are encouraging, and suggest that patients with ARFID exhibit similar improvements in a shorter period of time relative to patients with other ED treated in the same PHP. Future research should build upon these findings by exploring outcomes following completion of treatment, comparing outcomes to patients in control conditions, investigating which specific treatment components are effective, and determining how treatment can best be adapted to effectively treat the heterogeneous presentations of ARFID.

REFERENCES


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