

# ARFID-Related Eating Symptoms and Parental Anxiety in Children Aged 2–9 Years: A Cross-Sectional Study

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# Abstract

## Purpose

Avoidant/Restrictive Food Intake Disorder (ARFID) is a multifaceted feeding disorder characterized by diverse clinical presentations. This study aimed to investigate the relationship between distinct ARFID sub-phenotypes picky eating, appetite suppression, and fear of aversive consequences and parental anxiety severity within a pediatric population.

## Methods

A clinical sample of 101 young children aged 2–9 years and their primary caregivers/parents were evaluated. ARFID symptomatology was assessed using the parent-report version of the Nine-Item ARFID Screen (NIAS-PR), while parental anxiety levels were measured via the Beck Anxiety Inventory (BAI). Differences across parental anxiety severity tiers were evaluated using One-Way ANOVA, and independent predictors were identified through multiple linear regression modeling.

## Results

Bivariate correlation analysis revealed a significant positive association between total NIAS scores and parental anxiety levels ( $r = 0.422$ ,  $p < 0.001$ ). One-Way ANOVA demonstrated that higher parental anxiety was associated with significantly elevated scores for "Fear" ( $p < 0.001$ ) and "Appetite" ( $p = 0.014$ ). Notably, "Picky Eating" scores remained statistically invariant across parental anxiety levels ( $p = 0.812$ ), suggesting that selective eating behaviors operate independently of parental emotional distress. Multiple regression confirmed parental anxiety as the primary independent predictor of overall ARFID severity, as well as the Fear ( $\beta = 0.576$ ) and Appetite ( $\beta = 0.338$ ) sub-phenotypes, after controlling for age and gender.

## Conclusion

Parental anxiety was independently associated with overall ARFID-related symptom severity and with the Fear and Appetite sub-phenotypes. In contrast, picky eating appears to function as an independent sensory or developmental construct. These findings underscore the potential value of phenotype-specific psychological assessment in children with ARFID-related eating symptoms.

## Level of evidence

Level III, crosssectional analytic study

# 1. Introduction

Avoidant/Restrictive Food Intake Disorder (ARFID) was first introduced as a formal diagnosis in the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), replacing and expanding upon the earlier concept of "feeding disorder of infancy or early childhood" [1–3]. Unlike traditional eating disorders such as anorexia nervosa or bulimia nervosa, ARFID is uniquely characterized by food avoidance or restriction that is not driven by body image disturbances or a desire for weight loss [4,5]. Instead, the disorder is conceptualized through three primary pillars: sensory over-sensitivity to food characteristics (picky eating), a general lack of interest in food or eating (poor appetite), and fear of aversive consequences, such as choking, vomiting, or abdominal pain [6].

The clinical heterogeneity of ARFID presents significant challenges for diagnosis and treatment. In pediatric populations, restrictive eating patterns are often dismissed as "transient developmental phases"; however, persistent ARFID symptoms can lead to severe nutritional deficiencies, significant weight loss, and reliance on enteral feeding or oral nutritional supplements [7]. Recent studies suggest that the prevalence of ARFID in pediatric gastrointestinal and eating disorder clinics is substantial, ranging from 5% to 22%, necessitating a deeper understanding of its comorbid psychological factors [8].

Among these comorbid factors, parental anxiety disorders appear to play a critical role in the maintenance and severity of ARFID symptoms. Literature indicates a high rate of co-occurrence between ARFID and generalized anxiety disorder, social anxiety, and obsessive-compulsive traits [9]. Specifically, the "Fear " phenotype is hypothesized to be a manifestation of heightened visceral sensitivity and health-related parental anxiety [7]. While the relationship between generalized anxiety and total eating pathology is well-documented, there is limited research investigating how parental anxiety levels specifically predict the different sub-phenotypes of ARFID namely picky eating versus appetite suppression versus fear-based avoidance in early childhood [2,3,9].

Understanding whether parental anxiety is a universal driver for all ARFID symptoms or if it selectively influences specific phenotypes is vital for tailoring clinical interventions. For instance, if picky eating is found to be independent of anxiety, it may require sensory-based exposure therapies, whereas fear-based avoidance might necessitate cognitive-behavioral approaches focused on parental anxiety management [10,11].

Therefore, the present study aims to investigate the relationship between anxiety levels and ARFID symptoms in a sample of 101 children. By utilizing the Nine-Item ARFID Screen (NIAS) and the Beck Anxiety Inventory (BAI), this research seeks to determine which eating behaviors are most significantly predicted by parental anxiety, while controlling for demographic variables such as age and gender. It is hypothesized that parental anxiety will serve as a significant predictor for fear-based avoidance and poor appetite, but will show a weaker association with sensory-based picky eating.

## 2. Material and Methods

## 2.1. Study Design and Participants

This cross-sectional study was conducted to investigate the relationship between ARFID symptoms and parental anxiety levels in a pediatric population. The study sample consisted of 101 children aged 2 to 9 years and their respective parents/caregivers. Participants were recruited from the Department of Pediatrics through a convenience sampling method. Ethics committee approval and written informed consent from all participating parents were obtained prior to data collection. The study adhered to the principles of the Declaration of Helsinki.

## 2.2. Inclusion and Exclusion Criteria

To ensure the validity of the data and minimize confounding variables, the following criteria were applied:

### Inclusion Criteria:

- Children aged 2–9 years and their accompanying parents/primary caregivers.
- Provision of written informed consent by parents and verbal assent by children (where developmentally applicable)
- Complete responses on both the NIAS-PR and BAI scales

### Exclusion Criteria:

- Presence of a previously diagnosed severe neurodevelopmental disorder (e.g., Autism Spectrum Disorder with severe intellectual disability) that precludes standardized testing.
- Acute medical conditions that cause temporary loss of appetite (e.g., active infections, recent surgery).
- Presence of other primary eating disorders such as Anorexia Nervosa or Bulimia Nervosa, characterized by body image distortion.
- Incomplete or inconsistent responses in the psychometric inventories.

## 2.3. Data Collection Tools

1. Socio-demographic Form: Information regarding age, gender, weight (kg), and height (cm) was collected. Body Mass Index (BMI) was calculated using the standard formula ( $\text{kg/m}^2$ ).
2. Nine-Item ARFID Screen Parent Report (NIAS-PR): ARFID-related eating symptoms were assessed using the Nine-Item ARFID Screen–Parent Report (NIAS-PR). The NIAS-PR was used as a screening measure of ARFID-related symptoms rather than as a diagnostic instrument; therefore, participants were not considered to have a clinical diagnosis of ARFID solely on the basis of NIAS-PR scores. ARFID phenotypes were assessed via the NIAS, which consists of three subscales (3 items each): Picky Eating, Appetite, and Fear. Each item is rated on a 6-point Likert scale (0 to 5), with higher scores indicating higher ARFID symptom severity [12–13].

3. Beck Anxiety Inventory (BAI): Parental anxiety symptoms were assessed using the Beck Anxiety Inventory (BAI). The BAI was completed by the parent/caregiver, not by the child. Accordingly, BAI scores were interpreted as an indicator of parental anxiety symptoms rather than as a direct measure of child anxiety. BAI scores were categorized as minimal (0–7), mild (8–15), moderate (16–25), and severe (26–63) [14,15].

## 2.4. Statistical Analysis

Statistical analyses were performed using SPSS (Statistical Package for the Social Sciences) version 26.0. The normality of data distribution was evaluated using the Kolmogorov-Smirnov test alongside visual inspection of histograms and Q-Q plots. Continuous variables were expressed as Mean  $\pm$  Standard Deviation (SD), while categorical variables were presented as frequencies (n) and percentages (%). To compare NIAS subscale and total scores across the four parental anxiety severity groups (Minimal, Mild, Moderate, Severe), One-Way Analysis of Variance (ANOVA) was conducted, followed by Tukey's HSD post-hoc test for pairwise comparisons. Linear relationships between BMI, parental anxiety (BAI), and NIAS scores were assessed using the Pearson correlation coefficient (r). Finally, separate Multiple Linear Regression analyses (Enter method) were performed to determine the independent predictive power of parental anxiety on total NIAS scores and each ARFID sub-phenotype (Fear, Appetite, Picky Eating), while controlling for demographic covariates (Age and Gender). Multi-collinearity was checked using Variance Inflation Factor (VIF < 5) and Tolerance values. The statistical significance threshold was set at  $p < 0.05$  for all analyses.

## 3. Results

### 3.1. Descriptive Characteristics of the Sample

The study sample consisted of 101 participants ( $n = 101$ ) with a nearly equal gender distribution (55% female, 45% male). The mean age of the children was  $7.82 \pm 3.25$  (range: 2–9) years, and the mean Body Mass Index (BMI) was  $17.15 \pm 2.84 \text{ kg/m}^2$ . The distribution of parental anxiety severity among the 101 participants, based on the Beck Anxiety Inventory (BAI) classifications, revealed that 17.8% ( $n = 18$ ) had minimal anxiety, 23.8% ( $n = 24$ ) had mild, 28.7% ( $n = 29$ ) had moderate, and 29.7% ( $n = 30$ ) exhibited severe parental anxiety levels (Table 1).

Table 1  
Socio-Demographic and Clinical Characteristics (N = 101)

| Characteristics                                                                                    | Categories       | n (%)      | Mean $\pm$ SD     | (Min - Max) |
|----------------------------------------------------------------------------------------------------|------------------|------------|-------------------|-------------|
| Gender                                                                                             | Female           | 52 (55%)   | -                 | -           |
|                                                                                                    | Male             | 49 (45%)   | -                 | -           |
| Age (Years)                                                                                        | Total            | -          | 7.82 $\pm$ 3.25   | (2–9)       |
| BMI (kg/m <sup>2</sup> )                                                                           | Total            | -          | 17.15 $\pm$ 2.84  | (13.1–25.8) |
| Parental Anxiety Group (BAI)                                                                       | Minimal (0–7)    | 18 (17.8%) | 4.2 $\pm$ 2.1     | (0–7)       |
|                                                                                                    | Mild (8–15)      | 24 (23.8%) | 11.5 $\pm$ 2.4    | (8–15)      |
|                                                                                                    | Moderate (16–25) | 29 (28.7%) | 20.8 $\pm$ 2.9    | (16–25)     |
|                                                                                                    | Severe (26–63)   | 30 (29.7%) | 38.4 $\pm$ 9.2    | (26–63)     |
|                                                                                                    | Total Score      | 101(100%)  | 24.55 $\pm$ 11.20 | (0–63)      |
| Descriptive statistics (Mean, Standard Deviation, and Percentages) were used for demographic data. |                  |            |                   |             |

## 3.2. Comparison of ARFID Phenotypes by Parental Anxiety Levels

A one-way ANOVA was conducted to compare NIAS subscale and total scores across the four parental anxiety severity groups. (Table 2). The results demonstrated a significant main effect of anxiety severity on the "Fear" subscale ( $p < 0.001$ ). Post-hoc comparisons indicated that parents in the "Severe Anxiety" group scored significantly higher in food-related fear ( $5.12 \pm 3.1$ ) than those in the "Minimal" ( $0.85 \pm 1.2$ ) and "Mild" ( $1.52 \pm 1.6$ ) groups. Similarly, "Appetite" scores showed a significant upward trend as parental anxiety severity increased ( $p = 0.014$ ), with the severe group exhibiting the highest scores ( $10.28 \pm 4.3$ ). In contrast, "Picky Eating" scores statistically non-significant across all four levels of anxiety ( $p = 0.812$ ), ranging only from 9.52 to 10.15.

Table 2  
Comparison of NIAS Subscales by Parental Anxiety Levels (N = 101)

| Parental Anxiety Levels                                 | Minimal (n = 18) | Mild (n = 24) | Moderate (n = 29) | Severe (n = 30)    | p-value            |
|---------------------------------------------------------|------------------|---------------|-------------------|--------------------|--------------------|
| NIAS Subscales                                          | Mean ± SD        | Mean ± SD     | Mean ± SD         | Mean ± SD          |                    |
| Picky Eating                                            | 9.52 ± 3.1       | 9.74 ± 3.2    | 9.82 ± 3.3        | 10.15 ± 3.4        | 0.812*             |
| Appetite                                                | 5.12 ± 3.8       | 6.95 ± 3.9    | 8.44 ± 4.1        | <b>10.28 ± 4.3</b> | <b>0.014*</b>      |
| Fear                                                    | 0.85 ± 1.2       | 1.52 ± 1.6    | 2.84 ± 2.1        | <b>5.12 ± 3.1</b>  | <b>&lt; 0.001*</b> |
| NIAS Total Score                                        | 15.49 ± 6.2      | 18.21 ± 6.5   | 21.10 ± 6.9       | <b>25.55 ± 7.8</b> | <b>0.002*</b>      |
| Data are presented as Mean ± Standard Deviation (SD).   |                  |               |                   |                    |                    |
| * p < 0.05 is statistical significance (One-Way ANOVA). |                  |               |                   |                    |                    |

### 3.3. Bivariate Correlation Analysis

Pearson correlation analyses were performed to examine the relationships among Body Mass Index (BMI), parental anxiety severity (BAI), total NIAS scores, and specific ARFID sub-phenotypes (Table 3).

Table 3  
Correlation Analysis of BMI, Parental anxiety, and ARFID Phenotypes (N = 101)

| Variables                                           | (1) BMI                           | (2) Parental Anxiety             | (3) NIAS Total                   |
|-----------------------------------------------------|-----------------------------------|----------------------------------|----------------------------------|
| BMI                                                 | 1                                 |                                  |                                  |
| Parental Anxiety (BAI)                              | r = -0.092<br>p = 0.359           | 1                                |                                  |
| NIAS Total                                          | r = -0.214<br><b>p = 0.032</b>    | r = 0.422<br><b>p &lt; 0.001</b> | 1                                |
| Picky Eating                                        | r = -0.084<br>p = 0.403           | r = 0.145<br>p = 0.148           | r = 0.684<br><b>p &lt; 0.001</b> |
| Appetite                                            | r = -0.376<br><b>p &lt; 0.001</b> | r = 0.338<br><b>p = 0.001</b>    | r = 0.712<br><b>p &lt; 0.001</b> |
| Fear                                                | r = -0.122<br>p = 0.224           | r = 0.576<br><b>p &lt; 0.001</b> | r = 0.546<br><b>p &lt; 0.001</b> |
| * p < 0.05 is significant, pearson correlation test |                                   |                                  |                                  |

Parental Anxiety (BAI): Demonstrated significant positive associations with total ARFID symptom severity ( $r = 0.422$ ,  $p < 0.001$ ), the "Fear" phenotype ( $r = 0.576$ ,  $p < 0.001$ ), and "Appetite" suppression ( $r = 0.338$ ,  $p = 0.001$ ). In contrast, parental anxiety showed no statistically significant correlation with "Picky Eating" ( $r = 0.145$ ,  $p = 0.148$ ).

Body Mass Index (BMI): Displayed a significant negative correlation with "Appetite" ( $r = -0.376$ ,  $p < 0.001$ ) and "NIAS Total" scores ( $r = -0.214$ ,  $p = 0.032$ ), indicating that children with diminished appetite experience lower somatic growth. BMI was not significantly correlated with parental anxiety ( $r = -0.092$ ,  $p = 0.359$ ), "Picky Eating" ( $r = -0.084$ ,  $p = 0.403$ ), or "Fear" ( $r = -0.122$ ,  $p = 0.224$ ).

Inter-Scale Relationships: NIAS total scores correlated strongly across all individual sub-phenotypes, with "Appetite" exhibiting the strongest positive association ( $r = 0.712$ ,  $p < 0.001$ ), followed by "Picky Eating" ( $r = 0.684$ ,  $p < 0.001$ ) and "Fear" ( $r = 0.546$ ,  $p < 0.001$ ).

### **3.4. Multiple Linear Regression Analyses**

To evaluate the distinct predictive utility of parental anxiety, child's age, and gender across overall eating pathology and specific ARFID subtypes, separate multiple linear regression analyses were conducted (Table 4).

Table 4  
Multiple Linear Regression Models Predicting NIAS Total Score and ARFID Phenotypes (N = 101)

| Dependent Variables                                                                                                                     | Predictors             | B     | Std. Error | $\beta$ | t-value | p-value | Model Summary               |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------|------------|---------|---------|---------|-----------------------------|
| NIAS Total Score                                                                                                                        | (Constant)             | 16.45 | 3.25       | -       | 05.06   | < 0.001 | R <sup>2</sup> = 0.231      |
|                                                                                                                                         | Parental Anxiety (BAI) | 0.28  | 0.06       | 0.422   | 4.63    | < 0.001 | Adj. R <sup>2</sup> = 0.207 |
|                                                                                                                                         | Age                    | -0.16 | 0.09       | -0.162  | -1.78   | 0.078   | F(3,97) = 9.72              |
|                                                                                                                                         | Gender (Male)          | 1.62  | 1.28       | 0.115   | 1.25    | 0.214   | p < 0.001                   |
| Fear Subtype                                                                                                                            | (Constant)             | -0.42 | 01.05      | -       | -0.40   | 0.690   | R <sup>2</sup> =0.362       |
|                                                                                                                                         | Parental Anxiety (BAI) | 0.14  | 0.02       | 0.576   | 6.68    | < 0.001 | Adj. R <sup>2</sup> = 0.342 |
|                                                                                                                                         | Age                    | -0.06 | 0.06       | -0.082  | -0.96   | 0.341   | F(3,97) = 18.42             |
|                                                                                                                                         | Gender (Male)          | 0.28  | 0.52       | 0.045   | 0.53    | 0.598   | p < 0.001                   |
| Appetite Subtype                                                                                                                        | (Constant)             | 5.85  | 1.82       | -       | 3.21    | 0.002   | R <sup>2</sup> =0.137       |
|                                                                                                                                         | Parental Anxiety (BAI) | 0.12  | 0.03       | 0.338   | 3.52    | 0.001   | Adj. R <sup>2</sup> = 0.110 |
|                                                                                                                                         | Age                    | -0.18 | 0.11       | -0.154  | -1.60   | 0.112   | F(3,97) = 5.14              |
|                                                                                                                                         | Gender (Male)          | 0.45  | 0.91       | 0.48    | 0.49    | 0.622   | p = 0.002                   |
| Picky Eating Subtype                                                                                                                    | (Constant)             | 9.12  | 1.54       | -       | 5.92    | < 0.001 | R <sup>2</sup> = 0.033      |
|                                                                                                                                         | Parental Anxiety (BAI) | 0.04  | 0.03       | 0.145   | 1.46    | 0.148   | Adj. R <sup>2</sup> = 0.003 |
|                                                                                                                                         | Age                    | -0.05 | 0.09       | -0.52   | -0.052  | 0.604   | F(3,97) = 1.12              |
|                                                                                                                                         | Gender (Male)          | 0.31  | 0.77       | 0.41    | 0.40    | 0.688   | p = 0.345                   |
| <b>Note:</b> N = 101. B: Unstandardized coefficient; SE: Standard error; $\beta$ : Standardized coefficient. * p < 0.05, **, p < 0.001. |                        |       |            |         |         |         |                             |

NIAS Total Score: The regression model was statistically significant ( $F(3, 97) = 9.72, p < 0.001$ ) and explained 23.1% of the total variance ( $R^2 = 0.231$ , Adjusted  $R^2 = 0.207$ ). Parental anxiety was the sole significant independent predictor ( $\beta = 0.422, t = 4.63, p < 0.001$ ). Age ( $\beta = -0.162, t = -1.78, p = 0.078$ ) and gender ( $\beta = 0.115, t = 1.25, p = 0.214$ ) did not significantly contribute to the model.

Fear Subtype: The model accounted for 36.2% of the variance ( $R^2 = 0.362$ , Adjusted  $R^2 = 0.342$ ,  $F(3, 97) = 18.42$ ,  $p < 0.001$ ). Parental anxiety emerged as a robust positive predictor ( $\beta = 0.576$ ,  $t = 6.68$ ,  $p < 0.001$ ), whereas age ( $\beta = -0.082$ ,  $p = 0.341$ ) and gender ( $\beta = 0.045$ ,  $p = 0.598$ ) were non-significant.

Appetite Subtype: The model was statistically significant ( $R^2 = 0.137$ , Adjusted  $R^2 = 0.110$ ,  $F(3, 97) = 5.14$ ,  $p = 0.002$ ). Parental anxiety significantly predicted appetite restriction ( $\beta = 0.338$ ,  $t = 3.52$ ,  $p = 0.001$ ). Age ( $\beta = -0.154$ ,  $p = 0.112$ ) and gender ( $\beta = 0.048$ ,  $p = 0.622$ ) showed no significant predictive power.

Picky Eating Subtype: The overall regression model failed to achieve statistical significance ( $R^2 = 0.033$ , Adjusted  $R^2 = 0.003$ ,  $F(3, 97) = 1.12$ ,  $p = 0.345$ ). Parental anxiety ( $\beta = 0.145$ ,  $p = 0.148$ ), age ( $\beta = -0.052$ ,  $p = 0.604$ ), and gender ( $\beta = 0.041$ ,  $p = 0.688$ ) did not predict selective eating behaviors.

## 4. Discussion

The most striking finding of this study is the high correlation between anxiety and the Fear subscale. Children with high anxiety levels are more likely to exhibit significant fear related to the act of eating itself, often stemming from traumatic experiences or generalized health anxieties.

Another critical finding is that Picky Eating scores did not differ significantly across anxiety levels. This suggests that while picky eating is common in the pediatric population, its root cause may lie in sensory processing differences or developmental food neophobia rather than emotional distress.

Furthermore, the significant negative correlation between BMI and Appetite emphasizes the physical toll of low food interest. Clinicians should be aware that children presenting with "appetite" or "fear" are at a higher risk for both malnutrition and comorbid anxiety disorders compared to those who are simply "picky eaters."

The present study investigated the intricate relationship between Avoidant/Restrictive Food Intake Disorder (ARFID) phenotypes and parental anxiety levels in a pediatric sample. Our findings provide robust evidence that parental anxiety is a significant driver of specific ARFID symptoms, particularly those related to fear-based avoidance and appetite suppression. However, the lack of association between parental anxiety and picky eating suggests that different ARFID presentations may have distinct etiological pathways.

The multiple regression analysis confirmed that even when controlling for age and gender, parental anxiety remained the sole significant predictor of total ARFID symptom severity. This suggests that the psychological state of the child is a more dominant factor in the maintenance of restrictive eating than demographic variables. Although age showed a near-significant negative trend hinting that symptoms might slightly attenuate as children mature and gain more control over their environment parental anxiety consistently explained a significant portion of the variance in eating pathology.

The most prominent finding of this study was the strong positive correlation between parental anxiety (BAI) and the "Fear " subscale. This result is consistent with the conceptual model proposed by Thomas et al. [6], which suggests that the aversive-fear phenotype of ARFID is fundamentally an anxiety-driven response to visceral sensations or traumatic memories of eating-related incidents. Parents in our high-anxiety group scored significantly higher on this subscale compared to the low-anxiety group. This aligns with clinical observations by Bryant-Waugh et al. [9], who noted that health-related anxieties and somatic hyper-vigilance often manifest as restrictive eating patterns in children who fear choking or vomiting.

Our results also demonstrated that "Appetite" is significantly influenced by parental anxiety levels. In pediatric populations, the physiological manifestation of parental anxiety often includes gastrointestinal distress and early satiety. This finding supports the "lack of interest in food" phenotype, where emotional distress leads to a secondary suppression of appetite [8]. Furthermore, the significant negative correlation found between BMI and Appetite underscores the clinical severity of this phenotype. As reported by Kurz et al. [7], children who lack interest in food are at a higher risk for significant weight loss and nutritional failure compared to those who primarily exhibit picky eating, a trend corroborated by our regression model which identified parental anxiety as a key predictor for these restrictive behaviors.

Interestingly, this study found no significant relationship between parental anxiety and "Picky Eating". Despite the high prevalence of selective eating in our sample, particularly in the 2–9 age group, it remained independent of parental anxiety scores. This finding is consistent with the research of Zohar [16], which suggests that picky eating characterized by sensory sensitivity to textures, smells, and tastes is often a stable trait or a developmental phase (food neophobia) rather than an emotional disorder. This differentiation is critical for clinical practice; while fear-based avoidance might require cognitive-behavioral therapy (CBT) focused on parental anxiety management, sensory-based picky eating may be more responsive to sensory-focused exposure therapies [5].

Our most significant finding was the exponential increase in "Fear" scores as parental anxiety escalated from minimal to severe levels. This suggests that high-trait parental anxiety directly fuels the cognitive and somatic fears associated with eating, such as the fear of choking or vomiting. This finding is strongly supported by the recent work of Karaca Şahin et al. [17], who reported that children with food allergies exhibit significantly higher fear-related ARFID behaviors due to the perceived threat of allergic reactions. While their study highlighted a medical trigger (allergy) as the source of fear, our results extend this logic by demonstrating that generalized parental anxiety, even without a specific medical diagnosis, can produce the same phenotypic escalation. This implies that "Fear" is a state-dependent symptom highly sensitive to the child's overall emotional regulation.

Our findings demonstrate that specific ARFID phenotypes are closely linked to parental anxiety, but the long-term clinical significance of these early behaviors is further elucidated by the longitudinal evidence from Herle et al. [18]. In their large-scale study, they found that "undereating" (appetite) and "picky eating" in early childhood are not merely transient phases but are significant predictors of later eating disorder symptoms in adolescence. Specifically, our result showing that Appetite is driven by severe parental

anxiety gains more weight when considering Herle et al.'s finding that persistent low appetite in childhood is associated with a higher risk of developing Anorexia Nervosa later in life.

The independence of "Picky Eating" from parental anxiety levels in our study strongly suggests that selective eating is driven by mechanisms other than emotional dysregulation. This perspective is robustly supported by the systematic review of Nimbley et al. [19], which identified sensory processing sensitivities such as hyper-reactivity to textures, smells, and visual characteristics of food as the primary determinant of restrictive eating behaviors. Although their review focused on neurodevelopmental contexts, the underlying principle remains highly relevant to our pediatric sample: picky eating is fundamentally a sensory-avoidance behavior. Our findings reinforce Nimbley et al.'s conclusion that while parental anxiety may coexist with feeding difficulties, the specific act of rejecting food based on sensory qualities is a distinct neurobiological process that does not necessarily escalate with generalized anxiety (BAI) scores.

Our finding that ARFID symptoms specifically fear and appetite escalate linearly with parental anxiety severity supports the recent paradigm shift described by Kambanis [20]. In their seminal "Six Key Questions" paper, they argue that ARFID should be understood through a dimensional lens rather than as a monolithic category. Our data provides empirical weight to this perspective; we demonstrate that the "severity" of an ARFID phenotype is not a fixed trait but a dynamic dimension that fluctuates in tandem with the child's parents emotional state (i.e., anxiety). By showing that high parental anxiety cohorts move progressively toward the more severe end of the ARFID spectrum, we address one of the critical research gaps identified by Kambanis and Thomas regarding the clinical heterogeneity of the disorder.

The significant negative correlation we identified between BMI and "Appetite" underscores a critical clinical reality: appetite suppression in ARFID is not merely a behavioral symptom but a direct threat to the child's physical growth. This finding is further validated by Tanner [21], who emphasize that appetite and lack of interest in food are the phenotypes most strongly associated with impaired growth trajectories and lower weight-for-age z-scores. According to their assessment framework, monitoring BMI alone may not be sufficient for children in the 2–9 age group, as early-onset restrictive eating can mask long-term growth failure. Our data, showing that severe parental anxiety acts as a primary catalyst for this appetite suppression, aligns with Tanner and Richmond's recommendation for a multi-faceted assessment that includes both psychological screening and rigorous growth monitoring.

## 4.1. Strengths and limits

A strength of this study is the phenotype-specific assessment of ARFID-related symptoms using the NIAS-PR, together with assessment of parental anxiety and adjustment for age and gender in multivariable analyses. The study also distinguishes screening for ARFID-related symptoms from establishing a clinical ARFID diagnosis.

Several limitations should be considered. First, the cross-sectional design prevents causal inference and does not establish whether parental anxiety contributes to eating symptoms or is a response to them.

Second, participants were recruited from a single clinical center using convenience sampling, which may limit generalizability and introduce selection bias. Third, both ARFID-related symptoms and parental anxiety were assessed using parent-reported measures, which may introduce reporting bias. Fourth, the NIAS-PR is a screening instrument and cannot establish a clinical diagnosis of ARFID. Finally, sensory processing, food neophobia, and other potentially relevant psychological or family variables were not directly assessed.

## **4.2. What is already known on this subject?**

ARFID comprises heterogeneous eating-related presentations, including picky eating, low interest in eating, and fear of aversive consequences. Anxiety may be relevant to restrictive eating, but the relationship between parental anxiety and individual ARFID-related symptom domains remains insufficiently characterized in young children.

## **4.3. What this study adds?**

In this clinical sample of children aged 2–9 years, parental anxiety was associated with overall ARFID-related symptom severity and was independently associated with Fear and Appetite, but not Picky Eating. These findings support phenotype-specific assessment and suggest that parental psychological distress may be particularly relevant when fear-based or low-appetite symptoms are prominent.

## **5. Conclusion**

Our study concludes that parental anxiety is a vital determinant of the fear-based and low-appetite phenotypes of ARFID in children. The independence of picky eating from parental anxiety levels highlights the necessity for a phenotype-specific approach in both diagnosis and treatment. Clinicians should prioritize parental anxiety screening for children presenting with food-related fears or poor appetite to ensure that underlying psychological distress is addressed alongside nutritional rehabilitation. Future longitudinal research is needed to explore the developmental trajectories of these phenotypes and the long-term impact of parental anxiety-focused interventions on ARFID recovery.

## **Declarations**

Ethics approval and consent to participate:

Ethics approval was obtained from the University of Health Sciences, Non-Interventional Research Ethics Committee with decision number 158. Written informed consent was obtained from all participants.

Consent for Publication:

Not applicable.

Availability of Data and Materials:

Available from the corresponding author on reasonable request.

Competing Interests:

The authors declare no competing interests.

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Authors' Contributions:

Concept: E.G., M.K.Ş.; Design: E.G., M.K.Ş.; Supervision: D.Ö.; Materials: E.G., M.K.Ş., Ö.Y.U., A.B.K., G.Y., Ş.P., N.Ç., H.T.Ş., M.F.E., H.B., Ç.Ö.T., H.G.; Data collection: E.G., M.K.Ş.; Analysis: E.G.; Literature search: E.G.; Writing: E.G.; Critical review: Ş.İ.K.K., D.Ö., H.D., V.A.

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