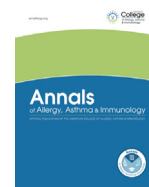




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High anxiety and health-related quality of life in families with children with food allergy during coronavirus disease 2019



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ABSTRACT

Background: Food allergy has a known effect on quality of life (QoL), but this has not been extensively studied during the coronavirus disease 2019 pandemic.

Objective: To characterize the levels of anxiety of mothers of children aged 0 to 8 years with food allergy compared with families of children without a food allergy and the health-related QoL among children with food allergy during the coronavirus disease 2019 pandemic.

Methods: In a mixed-methods study, Canadian mothers of children aged 0 to 8 years with (cases) and without (controls) food allergy provided demographic data and completed age-appropriate anxiety questionnaires between April 14, 2020, and April 28, 2020. The cases also provided food allergy-related data and completed the Food Allergy Quality of Life Questionnaire. In-depth interviews were subsequently conducted with purposefully selected cases.

Results: In a total of 580 participants, 5.5% were cases and 94.5% were controls. For mothers of children aged 0 to 1.5 years, anxiety levels did not differ between cases and controls. For mothers of children aged 1.5 to 8 years, anxiety levels were higher in cases vs controls ($P < .05$). Among the cases, neither overall nor domain-specific Food Allergy Quality of Life Questionnaire scores differed between age groups (0–3 vs 4–7 years), even after adjustment for confounding variables, including childcare during the pandemic. Qualitatively, the following 3 themes were identified: unexpected challenges of food shopping; less food-related food anxiety during the pandemic; and differences and delays in food allergy testing and therapy.

Conclusion: Mothers of children with food allergy reported high anxiety and poor health-related QoL. Yet, qualitatively, day-to-day food allergy management was better during the pandemic.

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Introduction

Food allergy affects approximately 6% of the pediatric population.¹ Both the child with food allergy^{2,3} and their caregivers⁴ report that their day-to-day quality of life (QoL) is affected. Parents of children with food allergy have higher levels of anxiety and lower health-related QoL (HRQL) compared with families of children without a food allergy.^{3,4} These differences are largely attributed to difficult social interactions with other families and the stresses associated with management of their child's allergy outside of the home, such as at school.^{2,5,6}

As a result of the coronavirus disease 2019 (COVID-19) pandemic, and the consequent public health measures, such as physical distancing and school closures, families are spending unprecedented amounts of time at home.⁷ As such, families' social encounters are dramatically reduced, as are the number of times children eat without their parents being present. Yet, during this time of physical distancing and school closures, it could be hypothesized that families have greater awareness of what their child eats. In turn, this may give rise to a sense of control that is not achievable when the child with food allergy eats out of home.⁸

Previous studies on food allergy have used a variety of anxiety and QoL tools^{9–13} in diverse populations.^{2,14–18}

We previously reported that the prevalence of depressive and anxiety symptoms among mothers of children aged 0 to 8 years is high during the COVID-19 pandemic.¹⁹ To the best of our knowledge, there are no previous reports of maternal anxiety and HRQL, with consideration to food allergy, during the current pandemic. In addition, although caregiver anxiety related to childhood food allergy has been well documented, few studies have done so qualitatively. The objective of this mixed-methods study was to characterize the levels of anxiety and the HRQL of families of children aged 0 to 8 years with food allergy compared with those of families of children without food allergy during the COVID-19 pandemic.

Methods

Study Design and Participant Recruitment

This mixed-methods study followed a sequential explanatory design, in which quantitative (survey) data were collected first and followed by qualitative (interview) data collection.²⁰ The participants completed an online survey on parenting during the COVID-19 pandemic (parentingduringthepandemic.com) between April 14, 2020, and April 28, 2020. A convenience sample of parents was recruited through online advertisements and social media platforms, and indirectly through local media announcements and news broadcast appearances by the senior author. Eligibility criteria were age more than or equal to 18 years and currently pregnant and, or had children aged 0 to 8 years. Because nearly all participants (88.8%) were mothers, we restricted our analyses to maternal data only. We further restricted our study population to mothers residing in Canada at the time of the survey. Informed consent was obtained before online survey completion. It took approximately 30 to 45 minutes for the participants to complete the survey.

The participants were queried about family demographics, including maternal age, age of children, childcare, family size and composition, parental education and income (including changes related to the COVID-19 pandemic), and country of residence. For the purposes of this analysis, we collapsed the childcare data into a binary variable of parent-provided care or assistance with childcare, before and during the pandemic. Changes in childcare because of the pandemic were based on reports of prepandemic assistance with childcare but parent-provided care during the pandemic.

Parents of children aged 0 to 1.5 years were asked to complete the Perinatal Anxiety Screening Scale (PASS).²¹ This 31-item scale assessed anxiety levels, with a clinical cutoff score of greater than or equal to 26. Parents of children aged 1.5 to 8 years were invited to complete the Generalized Anxiety Disorder 7-item scale (GAD-7).²² This survey had a clinical cutoff score of greater than or equal to 10. Both scales are widely used in the mental health literature and have excellent psychometric properties, including internal consistency and test-retest reliability.

All families were directed to a question as to whether their children had allergies. In the present analysis, families who reported to have children without food allergy were categorized as controls,

whereas families who reported to have children with food allergy were categorized as cases. The cases were asked to complete the Food Allergy Quality of Life Questionnaire—Parent Form (FAQLQ-PF),¹² a reliable and valid food allergy-specific questionnaire, with which our group has experience,^{2,5} and which is found to be reliable for short time intervals.¹² Because our study population was restricted to parents of children aged 0 to 8 years, we excluded section C ($n = 4$ questions) of the FAQLQ-PF, because this section targeted older children (>7 years only). We also restricted the present analysis to mothers who reported Canadian residency at the time of the survey. All participants who completed the online survey were entered into a draw to win 1 of 5 Ca\$100 electronic gift cards.

On completion of the survey, all participants were asked if they would be willing to be contacted for future studies, including qualitative interviews. For the purposes of this study, we performed qualitative, semistructured interviews²³ between May 18, 2020, and May 22, 2020, with mothers of children with food allergy only. Questions during these interviews focused on mothers' perceptions of managing their child's food allergy, including food procurement and preparation, during a pandemic. Mothers who participated in a qualitative interview received a 20 Canadian dollar electronic gift card.

Data Analysis

Quantitative data were described (n/N , percentage, and mean \pm SD). Linear regression with β and 95% confidence interval (95% CI) reported for analyses was used for the anxiety analyses. In each of these analyses, controls served as the reference category. Confounders were identified based on a priori knowledge and included the number of children in the home, mother's highest level of education, family income, and childcare during the pandemic. For analyses specific to HRQL among the cases, we also included the following 2 additional confounders: a history of anaphylaxis and the number of foods a child must avoid. Comparisons were considered statistically significant at P lesser than .05. Quantitative data were analyzed using the Stata statistical software version 15.1 (StataCorp, College Station, Texas).

Qualitative data were analyzed using thematic analysis,²³ a process that involved initial identification of surface descriptive content, at which time, we organized like-with-like ideas followed by identification of latent meaning. This 2-stage analysis permitted the iterative development of a coding guide, which we systematically applied and refined. The codes were then categorized into larger themes. Constructs were considered to be theoretically saturated when new or additional constructs ceased to be identified with subsequent interviews.

Mixing of the quantitative and qualitative data occurred at the interpretation stage.²⁴ We compared both sets of data to identify contradicting or discrepant data. This study was approved by the University of Manitoba Psychology/Sociology Research Ethics Board (P2020:030 [HS23849]).

Results

Of the 747 respondents to our survey, 580 (77.6%) met our inclusion criteria. This constituted our study population, of which cases and controls constituted 5.5% (32/580) and 94.5% (548/580), respectively (Table 1). Both cases and controls had, on average, families composed of 2 adults and 2 children. Before the pandemic, center-based childcare was most common for both cases (41.9%) and controls (46.5%), whereas most of the cases (78.1%) and controls (87.0%) were providing their own childcare during the pandemic. In this study, 27.6% of the cases and 31.0% of the controls reported an annual family income of more than \$140,000, although a few reported employment and income during the pandemic to be the same as prepandemic levels.

Table 1
Demographics of the Study Population, Stratified by Food Allergy Status

Demographics	Cases (N = 32)		Controls (N = 548)	
	n	%	n	%
Family composition				
Number of children 0-18 mo	12	37.5	232	42.3
Number of children 18 mo-4 y	18	56.3	327	59.7
Number of children 5-8 y	13	40.6	216	39.4
Number of adults in household	1.90 ± 0.39		2.00 ± 0.41	
Number of children in household	1.94 ± 0.84		1.82 ± 0.92	
Childcare before pandemic				
Center-based childcare	13	41.9	251	46.5
Home-based childcare	3	9.7	53	9.8
Nanny or babysitter	1	3.2	20	3.7
Relatives or friends	2	6.5	41	7.6
Providing own childcare	12	38.7	175	32.4
Financial situation^a				
Average annual income >\$140,000	161	31.0	11	27.6
Employed and paid at before COVID-19 levels	5	16.7	101	19.9
Childcare during pandemic^b				
Center-based childcare	0	0.0	9	1.6
Home-based childcare	2	6.3	7	1.3
Nanny or babysitter	2	6.3	12	2.2
Relatives or friends	3	9.4	34	6.2
Providing own childcare	25	78.1	475	87.0
Maternal characteristics^c				
Age (y)	33.2 ± 5.1		34.5 ± 5.2	
Married or common law	28	87.5	500	92.3
College or bachelor's degree	20	62.5	295	54.1
Postgraduate or professional degree	7	21.9	200	36.7

Abbreviation: COVID-19, coronavirus disease 2019.

^aA total of 3 cases and 29 controls declined to report income; 2 cases and 39 controls declined to respond to employment.^bA total of 1 case and 8 controls declined to respond to queries of before COVID-19 childcare; 2 controls declined to respond to queries of COVID-19 childcare.^cMissing data on marital status of 5 controls; educational attainment on 3 controls.

Of the 32 cases, 26 provided information on the type of food allergies. Of these, milk was the most common food allergen (6/26; 23.1%), followed by peanuts, tree nuts, and egg, with 5 of 26 (19.2%) of each of these allergies reported (Table 2). Most children had been diagnosed by an allergist (15/24; 62.5%), had to avoid 1 to 2 foods (18/25; 72.0%), and nearly one-third (8/28; 28.6%) had a history of anaphylaxis. For mothers with children aged 0 to 1.5 years, the mean PASS score was 22.6 plus or minus 16.1, with 38.7% of mothers reporting clinical anxiety (score of ≥ 26). Raw PASS scores were not statistically significantly different between cases ($n = 12$; mean, 27.17 [95% CI, 14.30–40.04]) and controls ($n = 143$; mean, 22.21 [95% CI, 19.61–24.81; $P = .31$]) (eTable 1). No differences were found in the PASS scores in fully adjusted models.

For mothers with children aged 1.5 to 8 years, the mean GAD-7 score was 7.2 plus or minus 6.0, with 33.8% of mothers reporting clinical anxiety (score of ≥ 10). Statistically significantly greater raw GAD-7 scores were found in cases ($n = 18$; mean, 10.33 [95% CI, 6.23–7.74]) than controls ($n = 233$; mean, 6.99 [95% CI, 6.23–7.74; $P < .02$]) (Table 3). This difference persisted in a fully adjusted model ($P < .05$). A total of 8 of 18 (44.4%) cases and 25 of 92 (27.2%) controls had clinical levels of generalized anxiety that was denoted as a cutoff score of greater than or equal to 10.

The FAQLQ scores were available for 10 children aged 0 to 3 years and 19 children aged 4 to 8 years (eTable 2). Neither overall nor domain-specific FAQLQ mean scores differed between the age groups. In regression analyses, the between-age group scores remained comparable, even after adjustment for confounding variables (eTable 3). Among cases who had had childcare before the pandemic, most reported being responsible for childcare because of the pandemic (13/19 [68.4%]). No differences in overall or domain-specific FAQLQ were identified between those with vs without childcare during the pandemic (all $P > .05$; results not found).

Table 2
Allergy Characteristics of Children

Characteristic	n	%
Type of food allergy (N = 26)		
Milk	6	23.1
Peanuts	5	19.2
Egg	5	19.2
Tree nuts	2	7.7
Fish	2	7.7
Wheat	1	3.8
Soya	1	3.8
Fruit	1	3.8
Decline to report	3	11.5
Number of foods required to avoid (N = 25)		
1-2	18	72.0
3-6	2	8.0
7-10	1	4.0
Decline to report	4	16.0
History of anaphylaxis (N = 28)		
Most recent anaphylactic reaction (N = 8)	8	28.6
Very recently	2	25.0
About 2 y ago	2	25.0
>2 y ago	4	50.0
Epinephrine autoinjector (N = 24)		
Food allergy diagnosis made by (N = 24)	13	54.2
General practitioner	3	12.5
Allergist	15	62.5
CAM practitioner	1	4.2
Pediatrician	5	20.8
Parental stress owing to food allergy (N = 26)		
None	5	19.2
A little or some	14	53.8
Quite a lot or a lot	3	11.5
Decline to report	4	15.4

Abbreviation: CAM, complementary and alternative medicine.

Finally, we interviewed 4 mothers who reported that their child had food allergy in the previously described survey and who consented to be contacted for follow-up studies (Table 4). All mothers were married and reported that the working status of themselves and their partners had not changed as a result of the pandemic. On average, there were 2.25 children in the household, with an average age of 4.56 years. All children had allergies to priority foods, based on Health Canada's classification.²⁵ From these interviews, we identified 3 themes (Table 5). First, families described unexpected challenges of food shopping during the pandemic, with stress and anxiety as common descriptors. Mothers also commented on shortages of ingredients that were needed to make alternatives to foods that may contain their child's allergen. For instance, mothers reported having trouble finding common ingredients, such as flour, yeast, and cocoa, which made it difficult to prepare allergen-free alternatives to packaged foods. Second, families reported less food-related anxiety during the pandemic, because their children were always in the care of one or both parents, which made logistics easier. Finally, the 2 families with the youngest children with

Table 3
Linear Regression Analysis of Parental Anxiety Screening Scores for Mothers of Children Aged 1.5 to 8 Years With Food Allergy Cases Compared With Controls Without Food Allergy

Group	n	Unadjusted		Model 1 ^a		Model 2 ^b	
		β	95% CI	β	95% CI	β	95% CI
Controls	233	Ref		Ref		Ref	
Cases	18	3.44 ^c	0.50-6.19	3.48 ^c	0.64-6.33	3.51 ^d	0.49-6.53

Abbreviations: CI, confidence interval; Ref, reference category.

^aAdjusted for number of children in the home, mother's highest level of education, and family income.^bAdjusted for confounders identified in model 1, including childcare during the pandemic and financial support during the pandemic.^c $P < .02$.^d $P < .05$.

Table 4
Characteristics of Mothers Interviewed on Perceptions of Their Child's Food Allergy During the Pandemic

Characteristic	n	%
Married	4	100
No change to income during pandemic	4	100
Change in childcare during pandemic	2	50
Average number of children in the home	2.25	
Average age of children with food allergy (y)	4.56	
Average number of food allergies	2	
Type of food allergy (confirmed allergies only)		
Priority allergen ^a	8	100
Nonpriority allergen ^b	0	0

^aMilk, egg, peanut, tree nut, fish, crustaceans and molluscs, soy, wheat and triticale, sulfites, mustard, and sesame.

^bFoods other than those named.

food allergy spoke of differences and delays in food allergy testing or therapy. Virtual visits were perceived favorably, although 1 mother described how routine testing was delayed until the clinic reopened. Another mother explained how her child's peanut oral immunotherapy was similarly postponed owing to the pandemic. In addition, 1 mother stated how she would not hesitate to present to the emergency department in the case of anaphylaxis, regardless of the pandemic-related concerns.

Discussion

This is the first study to document high rates of clinical anxiety, at approximately 44%, among mothers of children with food allergy during the COVID-19 pandemic, and one of the first to employ a mixed-methods approach to food allergy-related QoL. These mothers also reported low FAQLQ scores, as evidenced by a score of approximately 2 on a 7-point scale, with no differences between age groups or childcare responsibilities during the pandemic. Subsequent qualitative interviews provided the following insight into the paradoxical challenges of managing a food allergy during the pandemic: although food allergy was easier to manage because the child was home at all times, some parents were stressed by new challenges associated with grocery shopping or were affected by differences and delays in testing or therapy.

In this study, from an online convenience sample, elevated anxiety symptoms with clinical relevance were reported by approximately 34% of the participants. Although anxiety scores among mothers of

Table 5
Qualitative Themes of Perceptions of Mothers on Food Allergy During the Pandemic

Theme	Supporting quotation
Unexpected challenges of food shopping	<i>I feel stressed out and anxious about going to the store.</i> <i>It's harder to find baking products.</i>
Less food-related anxiety during the pandemic	<i>[Food allergy] is easier to manage during the pandemic. Before, we were always on alert.</i>
Differences and delays in food allergy testing or therapy	<i>We had a virtual visit with our allergist. Once clinics reopened, we went in person for a skin test and a blood test. It was as simple as can be.</i> <i>[Child] was supposed to start OIT, but that has been delayed due to the pandemic. The new guidelines for anaphylaxis make me nervous. I'd still give epi and go to the emergency room, even during a pandemic.</i>

Abbreviations: Epi, epinephrine; OIT, oral immunotherapy.

children aged 0 to 1.5 years did not differ between cases and controls, we highlight that the mean PASS score of the cases exceeded the cutoff for clinical anxiety. Mothers of children aged 1.5 to 8 years with food allergy reported significantly higher anxiety scores, even after adjusting for confounding variables, including finances and childcare during the pandemic. Because children of these ages are typically in the care of others during the day (ie, daycare and school), levels of anxiety among mothers of children with food allergy may be higher at baseline. Our study design did not permit a comparison of anxiety in the same study population before vs during the pandemic, to establish whether the anxiety level among the cases remained steady or was altered during the pandemic. Likewise, the cross-sectional design of our study precludes any interpretation of a causal relationship between the pandemic and anxiety. Nonetheless, the level of anxiety identified in this study is high and is the first to reveal the paradoxical difference that, although parents qualitatively describe their food allergy-related anxiety as low, quantitative data point toward disproportionately higher rates of anxiety among these families than controls. It may be that parents of children with food allergy no longer attribute their stress and anxiety to food allergy and simply perceive the symptoms as a normal part of life.

In a recent review article, Polloni and Muraro²⁶ described how parental instinct of anxiety intensifies when the child is diagnosed to have food allergy.²⁷ In part, this anxiety was attributable to a need to control daily activities,^{28–30} constant vigilance,^{28–30} and others' incomplete understanding of food allergy.^{28–30} Yet, as most families are spending considerable amounts of time in their own homes during the pandemic, we were struck by the clear and elevated levels of anxiety among families of children with food allergy.

The effects of an illness and its consequent therapy on a patient, as perceived by the patient (or, in the case of young children, the parent),³¹ is captured in measures of HRQL. Food allergy HRQL has been consistently reported as low in prepandemic studies,^{2,3,5,32} with similarly low findings identified in the present study. The 3 domains that comprise overall food allergy HRQL, as measured by the FAQLQ, include emotional impacts such as lack of control and food worry; food anxiety, including concerns about eating out or poor labeling on food products; and social and dietary limitations owing to food allergy.⁵ Because the survey was administered when most nonessential businesses were closed owing to COVID-19, it could be postulated that some items, such as eating out or social limitations, included in these domains would be less relevant. The inclusion of interview data in this mixed-methods design contributed to an enhanced understanding of the HRQL findings.

The 4 mothers who were interviewed all spoke explicitly about being "lucky" or in fortunate circumstances during the pandemic, because all remained working or were on maternity leave during the pandemic and were financially stable. Nonetheless, they also described that they were now preparing nearly all the meals and snacks for their families and felt stressed or rushed when grocery shopping. They also struggled to find products, such as flour, that they routinely used to make foods for their families to mitigate the risk of cross-contamination in preprepared goods. Despite these challenges, the day-to-day management of food allergy was perceived as being easier during the pandemic than normal times. These interviews were conducted approximately 2 months after the start of the pandemic, and thus, families may have had time to adjust to life during the pandemic. In a previous study, mothers of children with allergy sought to "live an ordinary family life"³³ and that leaving their children in the care of others was worrisome.⁸ At the same time, food allergy management was described as being "overwhelming" without support.⁸ During a pandemic, when families are isolating at home, they are without the external support, which creates a tenuous balance of worry and reprieve.

Some mothers described modified appointments with their allergists, delayed oral immunotherapy, or concern about presenting

to an emergency department in the unlikely event of an anaphylactic reaction.^{34,35} Although face-to-face allergy-related visits are not indicated, with few exceptions, during the COVID-19 pandemic,³⁴ delayed testing and treatment may still be frustrating for families. There was also an awareness of the risk of anaphylaxis. Although anaphylaxis deaths are rare,³⁶ recent guidelines regarding anaphylaxis have shifted to “extended clinical observation in a setting capable of managing anaphylaxis” (not explicitly an emergency department) “to detect a biphasic reaction”³⁷ and to not present to an emergency department if anaphylaxis is controlled with 1 dose of epinephrine to avoid the risk of exposure to severe acute respiratory syndrome coronavirus 2. Despite these recommendations, some mothers spoke of going to the emergency department if their child had an anaphylactic reaction.

Taken together, our quantitative and qualitative findings point toward higher proportions of anxiety among mothers of children with food allergy compared with controls. In 2016, Birdi et al.³⁸ described that parents of children with food allergy have significantly higher levels of anxiety ($P < .006$) than those of children without food allergy. Despite parents’ near-total control of their children’s diets during isolation, these elevated rates still persist. Although families of children with food allergy generally reported day-to-day management to be easier during the pandemic, some described stress around near-constant meal preparation, whereas others expressed underlying concerns with missing important appointments, in addition to worries on presenting to an emergency department during the pandemic.

We acknowledge the limitations of our study, including a study population that was restricted to mothers of children aged 0 to 8 years. As such, our results are not generalizable to families with older children or teenagers, who are likely to be more aware of the effect of the pandemic on their daily lives than younger children. Most of our study population were economically advantaged, with nearly one-third reporting household incomes greater than \$140,000, which limits the generalizability of our findings. We highlight other research on child health risks during the pandemic regarding concerns of psychosocial distress and food insecurity for families living in poverty, regardless of food allergy status.³⁹ In addition, the sample sizes were small. Yet, the proportion of children with food allergy in our study population (5.5%) was in keeping with a recently reported prevalence estimate of food allergy in Canadian children (6.1%).¹ With regard to qualitative work, the emphasis remains on the richness and depth of data rather than on the volume or number of interviews performed.²³

We highlight that, to the best of our knowledge, this is the first mixed-methods study on the associations and perceptions of food allergy-related anxiety and HRQL during the COVID-19 pandemic. The mixed-methods design contributed to a much richer and more profound understanding than would have been possible with either quantitative or qualitative data alone. Given the ubiquity and roles of food in all cultures, inclusion of patients voices in food allergy research is increasingly recognized,⁴⁰ and is gaining ground in food allergy research.^{30,40}

Findings from this study may further inform stakeholder decisions as the society continues to navigate the burden and issue orders to contain the spread of severe acute respiratory syndrome coronavirus 2. These findings also highlight the need to screen the caregivers of children with food allergy for anxiety, during and beyond COVID-19, and to refer to an appropriate mental health care provider, to educational programs, and/or for behavioral intervention. Moreover, the findings presented herein will be useful when developing guidelines to protect consumers with medical dietary restrictions, during any subsequent waves of COVID-19, and/or other future preparedness planning. These findings also point toward a need to address the challenges faced by families burdened with both food allergy and food insecurity, given the pandemic-related food

supply issues. Our findings also indirectly underscore the profound burden with which families of children with food allergy live. Interestingly, mothers of children with food allergy were still found to have higher levels of anxiety relative to mothers of children without food allergy despite qualitatively reporting a drop in anxiety as a result of physical distancing orders and school closures. Herein, our study population was restricted to mothers. In the future, it would be interesting to consider the perspective of fathers, as it could be hypothesized that most were, before the pandemic, working outside the home, but who may have increased food preparation responsibilities during the pandemic. Time will tell, if and how, families’ anxiety and HRQL change, once societies and schools begin to reopen. Likewise, allergists ought to be aware of the potential for changes in HRQL and anxiety in families of children with food allergy as restrictions are lifted, because these families will need to re-adapt to changes in childcare and their decreased ability to monitor their children’s food intake.

In conclusion, in a sequential explanatory mixed-methods study of Canadian mothers, anxiety was more prevalent among those with children with a food allergy compared with controls. Mothers of children with food allergy reported poor HRQL. Qualitatively, day-to-day food allergy management was better during the pandemic, although there were concerns around delayed testing and treatment, and the unlikely but not impossible, risk of anaphylaxis.

Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.anai.2020.09.010>.

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Supplementary Data

eTable 1

Linear Regression Analysis of PASS for Mothers of Children Aged 0 to 1.5 Years With Food Allergy Cases Compared With Controls Without Food Allergy

Group	n	Unadjusted		Model 1 ^a		Model 2 ^b	
		β	95% CI	β	95% CI	β	95% CI
Controls	143	Ref		Ref		Ref	
Cases	12	2.26	–7.10 to 11.6	2.26	–7.10 to 11.6	2.74	–7.07 to 12.6

Abbreviations: CI, confidence interval; PASS, Parental Anxiety Screening Scores; Ref: reference category.

^aAdjusted for number of children in the home, mother's highest level of education, and family income.

^bAdjusted for confounders identified in model 1, including childcare during the pandemic.

eTable 2

Food Allergy HRQL Scores Among Parents of Children Aged 0 to 3 Years (n = 10) and 4 to 8 Years (n = 19) With Food Allergy

Domain	Age (y)	Mean	SD	P value
Overall HRQL	0–3	2.08	1.40	.74
	4–8	1.89	1.50	
EI	0–3	2.08	1.43	.76
	4–8	1.91	1.36	
FA	0–3	1.97	1.88	.95
	4–8	1.92	1.55	
SDL	0–3	2.10	1.39	.67
	4–8	1.83	1.67	

Abbreviations: EI, emotional impact; FA, food anxiety; HRQL, health-related quality of life; SDL, social and dietary limitation.

eTable 3

Linear Regression Analysis of Overall- and Domain-Specific Food Allergy-Related HRQL Scores for Mothers of Children Aged 0 to 3 Years Compared With Children Aged 4 to 8 Years

Domain	Age (y)	Unadjusted		Model 1 ^a		Model 2 ^b		Model 3 ^c	
		β	95% CI	β	95% CI	β	95% CI	β	95% CI
Overall HRQL	0–3	Ref		Ref		Ref		Ref	
	4–8	–0.28	–1.29 to 0.74	–0.69	–1.96 to 0.57	–0.69	–2.02 to 0.64	–0.67	–2.55 to 1.21
EI	0–3	Ref		Ref		Ref		Ref	
	4–8	–0.24	–1.20 to 0.72	–0.66	–1.87 to 0.54	–0.65	–1.94 to 0.63	0.49	–2.29 to 1.31
FA	0–3	Ref		Ref		Ref		Ref	
	4–8	–0.09	–1.23 to 1.05	–0.62	–2.04 to 0.79	–0.63	–2.12 to 0.87	–0.60	–2.71 to 2.51
SDL	0–3	Ref		Ref		Ref		Ref	
	4–8	–0.41	–1.51 to 0.69	–0.73	–2.11 to 0.65	–0.73	–2.18 to 0.71	–0.95	–2.96 to 1.05

Abbreviations: CI, confidence interval; EI, emotional impact; FA, food anxiety; HRQL, health-related quality of life; Ref, reference category; SDL, social and dietary limitation.

^aAdjusted for number of children in the home, mother's highest level of education, and family income.

^bAdjusted for confounders identified in model 1, including childcare during the pandemic.

^cAdjusted for confounders identified in model 2, including history of anaphylaxis and the number of foods the child must avoid.