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Original Article

Treatment of allergic reactions and quality of life among caregivers of food-allergic children

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ABSTRACT

Background: Caregivers of food-allergic individuals (FAIs) have decreased quality of life (QoL). The effects of epinephrine administration on QoL are poorly understood.**Objective:** To investigate the relation between QoL and epinephrine use.**Methods:** A de-identified 50-question online survey was administered to caregivers of FAIs across the United States through Web site, email, and social media networks of 2 national food allergy advocacy groups. QoL was assessed using the Food Allergy Quality of Life—Parental Burden questionnaire. The effect of prior epinephrine administration on QoL was analyzed using linear regression.**Results:** Of 3,541 respondents, 35.6% reported their FAIs received epinephrine. Mean Food Allergy Quality of Life—Parental Burden scores were higher (worse QoL) in those reporting FAIs receiving epinephrine (3.07 vs 2.84, $P < .001$), anaphylaxis (3.01 vs 2.75, $P < .001$), multiple food allergies (3.16 vs 2.67, $P < .001$), and multiple food allergies and epinephrine use (3.24 vs 2.57, $P < .001$) vs those who did not. In a regression model, reported epinephrine use; anaphylaxis; multiple FAIs; multiple food allergies; and egg or milk, wheat or soy, or seafood allergy (vs peanut or tree nut allergy) were significantly associated with an increased (worse) QoL score. Caregiver college education and increasing FAI age were associated with a decreased QoL score (improved QoL). An interaction was noted between reported epinephrine use and anaphylaxis and was associated with a decreased QoL score.**Conclusion:** The effect of epinephrine use on caregiver QoL is conditional and depends on reaction severity. Having multiple FAIs and FAIs with multiple food allergies was associated with worsening QoL. Further studies are needed to better understand the effects of treating an allergic reaction on caregiver QoL.

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Introduction

Food allergy affects an estimated 4% to 8% of children in the United States.^{1,2} The severity of food allergy reactions also might be increasing, with a reported doubling of severe allergic reactions in the past decade.^{1–3} To date, serologic IgE testing or skin prick testing to foods has been unable to accurately predict reaction severity.^{4–6} Food allergy is a chronic illness but is unique compared with other

childhood chronic illnesses in that food-allergic individuals (FAIs) lack chronic or ongoing physical symptoms. Instead, FAIs and their caregivers carry a daily burden of the potential risk of developing a severe reaction that can cause considerable psychosocial stress and anxiety in caregivers.^{7,8} Health-related quality of life (HRQoL) has been proposed as a meaningful measurement of food allergy

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severity and daily burden of disease, but food allergy HRQoL is poorly measured by generic QoL measurements because food allergy lacks large shifts in health status owing to symptom burden.^{9–11} Several food allergy disease-specific HRQoL questionnaires have been developed and validated, including the Food Allergy Quality of Life Questionnaires (FAQLQ) in Europe and the Food Allergy Quality of Life—Parental Burden (FAQL-PB) and Teen versions, which address QoL in US caregivers of children and QoL in teenagers.^{12–16} Studies have noted impaired QoL in FAIs and caregivers, which is influenced by the number of allergens, allergic comorbidities, and severity of previous reactions.^{12,17–22} Data are conflicting as to how FAIs with a history of anaphylaxis influence caregiver QoL, with studies showing non-clinically significant change, no effect, or limited effect only in certain domains.^{12,17,18,20} QoL of families can be influenced more by the daily precautions taken and the concern for potential serious reaction in the future, rather than by a history of anaphylaxis.^{18,21,23,24}

Epinephrine is the emergency treatment of choice for food-induced anaphylaxis.²⁵ The burden of epinephrine treatment has been studied in a hymenoptera-allergic population, and epinephrine carriage was found to be more burdensome than undergoing venom-specific immunotherapy.²⁶ However, food oral immunotherapy is still investigational, so a similar study in food allergy cannot be conducted.^{27,28} Data from Kim et al²⁹ suggested that a lack of prior epinephrine administration and device training was significantly correlated with diminished caregiver comfort; however, the degree to which fear or other psychological factors influences parental comfort with an epinephrine device use is unknown. The provision of epinephrine is associated with decreased FAI QoL, but no study has investigated the effect of epinephrine use on caregiver QoL in relation to food allergy.³⁰ Therefore, the purpose of this study was to explore the association between a reported history of epinephrine administration in FAIs and caregiver QoL in relation to food allergy.

Methods

Study Participants

During the summer and autumn of 2012, study participants were openly recruited across the United States by email contact, social media feeds, and the Web sites of Kids With Food Allergies Foundation (now a division of the Asthma and Allergy Foundation of America) and the Food Allergy and Anaphylaxis Network (now the Food Allergy Research and Education), 2 national food allergy advocacy groups. Eligible participants included caregivers identifying themselves as older than 18 years and reporting at least 1 child with a food allergy diagnosed by a physician. Caregivers with more than 1 FAI were asked to retake the survey based on their experience with each FAI. This study was determined exempt from ongoing review by the University of Michigan Medical School institutional review board.

Participants were asked to complete an anonymous 50-question online survey querying demographic information, FAI baseline food allergy history, and responses to the FAQL-PB index.¹² The history questions inquired about reported symptoms of the FAI's most severe allergic reaction, reaction treatment, caregiver impression of the severity of the reaction (eg, how severe did the caregiver consider the reaction to be, including whether the reaction seemed to be consistent with anaphylaxis), follow-up care of the FAI's food allergy, allergic and nonallergic comorbidities, anaphylaxis management training, and sociodemographic information (eg, sex, self-reported race or ethnicity, self-reported combined family income, reported age of onset of allergy, and most severe reaction). Caregivers also were asked questions related to any episodes in which the FAI was administered epinephrine, including specific symptoms necessitating epinephrine use, the person administering epinephrine, and prior caregiver training to use an epinephrine auto-injector.

The FAQL-PB is a 17-item self-administered questionnaire that measures the effect of pediatric food allergy on caregiver QoL; it was developed and validated by Cohen et al¹² (eFig 1). It has a reported Cronbach α of 0.95, indicating strong reliability. Caregiver QoL was not assessed at a uniform time from diagnosis during the formulation and validation of this scale, and the scale is validated only for cross-sectional QoL assessment.¹² Each of the 17 questions is a 7-point Likert item and the index is scored as a summated rating scale, with a higher FAQL-PB score indicating worse QoL. The clinical significance of changes in QoL measurements is assessed by evaluating a minimal clinically important difference (MCID), defined as “the smallest difference in score in the domain of interest which patients perceive as beneficial and which would mandate, in the absence of troublesome side effects and excessive cost, a change in the patient's management.”³¹ For 7-point Likert scales analyzing QoL, prior studies have used an approximate MCID of 0.5 based on work by Jaeschke et al.^{31,32} However, 0.5 is not an absolute MCID value that is adaptable to any 7-point scale—MCID is specific to the particular QoL index, the disease being studied, and the population being surveyed.³³ Therefore, because no true MCID has been calculated for the FAQL-PB (eg, no other published studies have calculated a disease- or index-specific value), an MCID of 0.5 for the index (as previously used in its validation) is speculative and findings lower than 0.5 were not rejected as clinically insignificant, given that this value has not been proved to have clinical significance in this population.

Data were analyzed using frequency analysis to report descriptive statistics. Bivariate inferential analysis was performed using the χ^2 or Fisher exact test, the Kruskal-Wallis test, and the Student *t* test. Adjusted multiple linear regression was used to explore the relation between the main outcome of QoL score and several covariates. No backward stepwise selection of predictor variables was used, and analysis was prespecified based on previously reported FAQL studies, the authors' clinical suspicion, and prior and ongoing research of food allergy QoL by the authors' research group.³⁴ Multi-collinearity of independent variables was assessed using inspection of the variance inflation factor, and model specificity was assessed by the STATA linktest (model specification link assessment) and *ovtest* (Ramsey reset test for omitted variables) commands. Data were analyzed with STATA IC 12 (STATA Corp, College Station, Texas). Based on a level of significance of .05, the study had 80% power to detect a 0.5 difference in QoL score between those who reported a history of epinephrine administration and those who did not and between those who reported a history of anaphylaxis and those who did not with 65 patients per arm.

Results

Baseline Demographics

A total of 4,069 caregivers consented to participate in the survey and identified themselves as having at least 1 FAI younger than 18 years with a food allergy diagnosed by a physician. Table 1 presents baseline demographics of the sample and Table 2 presents the characteristics of the food-allergic children. Most FAIs were white (74.2%) and their most severe reaction was reported to occur before 5 years of age (90.5%). More than half of responding caregivers (59.9%) indicated they perceived their child's most severe reaction resulted in anaphylaxis, and 1,384 FAIs (34%) had a reported history of epinephrine use. Eighty-one percent of caregivers reported that they received training by a professional in how and when to administer an epinephrine auto-injector.

Food Allergy Quality of Life—Parental Burden

The FAQL-PB had a Cronbach α of 0.96 in this population, indicating strong internal reliability. eFigure 2 shows the mean total and

Table 1
Demographic characteristics of caregivers with food-allergic children

Characteristic ^a	Caregivers, n (%)
Respondent is the mother (n = 3,904)	3,718 (91.4)
Geographic region (n = 3,460)	
Northeast	994 (28.7)
North Midwest	660 (19.1)
South	780 (22.5)
Midwest	428 (12.4)
Mountain and Pacific	598 (17.3)
College graduate or beyond (n = 3,672)	2,753 (74.9)
Income, \$ (n = 3,288)	
<20,000	69 (2.1)
20,000–49,999	327 (9.9)
50,000–99,999	1,155 (35.1)
>100,000	1,737 (52.8)
Private health insurance (HMO or PPO) (n = 3,434)	3,142 (91.5)
Food allergy support group membership (n = 3,580)	
Not a member	1,420 (39.6)
Member of ≥1 group	2,160 (60.3)
Food-allergic children (n = 3,587)	
1	2,811 (78.4)
>1	776 (21.6)

Abbreviations: HMO, health maintenance organization; PPO, preferred provider organization.

^aA total of 4,069 took the survey but respondents were not required to answer every question.

domain FAQL-PB scores for the population. Mean QoL score was significantly higher (worse QoL) in those with a reported history of epinephrine use vs those who had not used epinephrine (3.07 [95% confidence interval [CI] 2.99–3.14] vs 2.84 [95% CI 2.78–2.89], mean difference 0.23, $P < .001$; Fig 1). Similarly, mean QoL score was significantly higher (worse QoL) in those reporting a history of anaphylaxis vs those without a history of anaphylaxis (3.01 [95% CI 2.94–3.1] vs 2.75 [95% CI 2.68–2.83], mean difference 0.25, $P < .001$; Fig 2). Mean FAQL-PB score was significantly higher (worse QoL; 3.16 [95% CI 3.1–3.22] vs 2.67 [95% CI 2.6–2.73], mean difference 0.49, $P < .001$) in those reporting multiple (>1) food allergies vs those with a single food allergy across all QoL domains (Fig 3). In addition, mean QoL score was significantly higher (worse QoL) in those with a reported history of multiple food allergies and a history of epinephrine use vs those with only a single food allergy and no prior epinephrine use in all QoL domains (3.24 [95% CI 3.13–3.33] vs 2.57 [95% CI 2.49–2.64], mean difference 0.67, $P < .001$; Fig 4).

Regression Model of Factors that Influence Food Allergy QoL

A multiple adjusted linear regression model was created to determine factors that were associated with increased (worsening) FAQL-PB score (Table 3). This demonstrated independent, statistically significant associations between QoL score and reported epinephrine use (increased score, worse QoL); a reported history of anaphylaxis (increased score, worse QoL); older current FAI age (decreased score, better QoL); presence of other FAIs in the family (increased score, worse QoL); egg or milk, wheat or soy, and sea-food allergy compared with peanut or tree nut allergy (all increased score, worse QoL); and caregiver college education (decreased score, enhanced QoL). There was an interaction effect noted with the reported use of epinephrine, showing that the effect of reported epinephrine use on QoL was conditional (dependent) on a reported history of anaphylaxis. Although reported epinephrine use or reported anaphylaxis was independently associated with an increased QoL score (worse QoL with either variable), in caregivers reporting a history of epinephrine use and prior anaphylaxis there was a moderating effect that resulted in a decreased QoL score (better QoL; eg, having 1 of these reported features without the other resulted in a score indicative of a worse QoL, but if the 2 attributes were present, the QoL score was lower).

Table 2
Characteristics of caregivers' food-allergic children (N = 4,069)

Characteristics ^a	FAIs, n (%)
White race (n = 3,397)	3,021 (74.2)
Current age (yr) (n = 3,526)	
0–5	1,653 (46.8)
6–10	1,326 (37.6)
11–18	547 (15.5)
Age at most severe food allergic reaction (yr) (n = 3,518)	
0–5	3,184 (90.5)
6–10	253 (7.2)
11–18	81 (2.3)
Food allergy (n = 3,850)	
Peanut	2,998 (77.8)
Tree nut	2,162 (56.2)
Egg	1,829 (47.5)
Milk	1,666 (43.3)
Shellfish	552 (15.4)
Wheat	575 (14.9)
Soy	587 (14.9)
Fish	348 (9)
Allergist diagnosed food allergy (n = 3,913)	3,288 (84.3)
History of anaphylaxis (n = 3,683)	2,208 (59.9)
Multiple episodes of anaphylaxis	1,149 (31.2)
Allergic comorbidity (n = 3,665)	
Eczema	1,954 (53.3)
Asthma	2,645 (72.1)
Allergic rhinitis	2,415 (65.9)
History of epinephrine use (n = 3,887)	1,384 (34)
Used epinephrine >1 time	533 (13.1)
Caregiver or another family member administered epinephrine (n = 1,384)	773 (56.8)
Frequency that FAI has available source of epinephrine (n = 3,748)	
More often than not	3,401 (90.1)
Often	157 (4.2)
Less often than not	52 (1.4)
Not very often	27 (0.7)

Abbreviations: FAIs, food-allergic individuals.

^aA total of 4,069 took the survey but respondents were not required to answer every question.

Discussion

This is the largest US QoL study to date assessing the disease-specific burden of food allergy in caregivers of FAIs (n = 4,069) and the largest study worldwide using the FAQL-PB questionnaire. To the authors' knowledge, no prior study has addressed the impact of epinephrine use on caregiver QoL, which was independently associated with worsening QoL after undergoing multiple covariate adjustments. However, this effect also was conditional, resulting in a decreased QoL score (better QoL) in caregivers reporting a history of epinephrine use and a history of anaphylaxis, but an increased QoL score (worse QoL) when epinephrine use was reported without a reported history of anaphylaxis. These data pertaining to the effects of the use of epinephrine and the conditional nature of the interaction among certain subgroups of individuals are novel. There are limited data pertaining to how epinephrine carriage or its provision influences QoL. Kim et al²⁹ noted that higher caregiver empowerment scores correlated with greater comfort with future epinephrine use, and Pinczower et al³⁰ noted detrimental QoL effects in FAIs from the mere provision of an auto-injector device. However, neither study explored the specific effect of epinephrine device use and reaction severity on QoL in patients or caregivers.

Epinephrine is a potentially lifesaving drug, and FAIs are instructed to carry epinephrine at all times and use it when specific symptoms develop in the course of an allergic reaction.³⁵ These data related to QoL could capture the sense of pervasive doubt, confusion, and insecurity in caregivers about how (and when) to best treat their child's allergic reaction, and an uncertainty that even after the reaction has resolved that the "right" action was

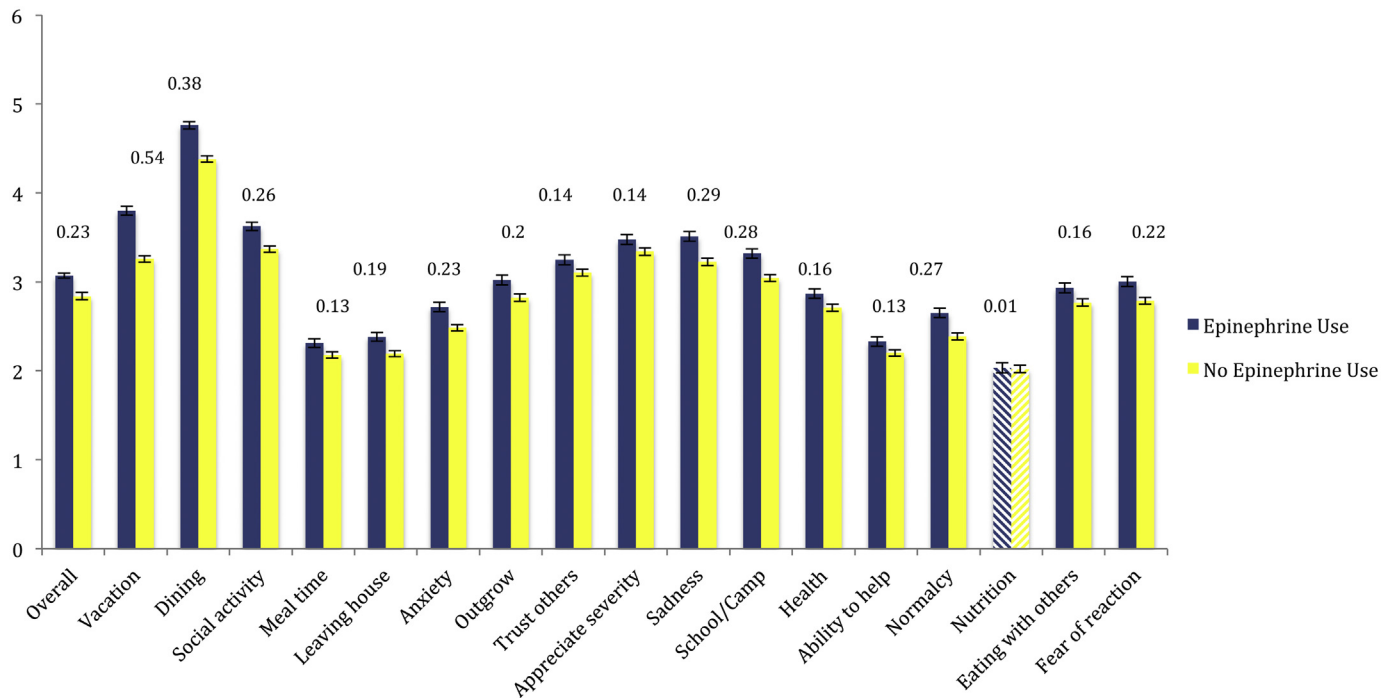


Figure 1. Effect of a history vs no history of epinephrine use on mean Food Allergy Quality of Life–Parental Burden questionnaire score. The difference was statistically significant ($P < .05$) in all but the nutrition quality-of-life domain (striped bar). Mean difference for each domain is labeled. Error bars represent standard error.

taken. Prior QoL research has denoted major themes of caregiver frustration, uncertainty, and anxiety regarding treating a reaction.³⁶ Caregivers might be confused by action plans that stratify different treatments for “minor” vs “major” reactions (or for exposure in those considered to have a “severe allergy”) or by a push from certain providers who recommend epinephrine be universally given in any person having any severity of allergic reaction.^{35,37} Ultimately, what the present findings most likely

suggest is that families need additional support to be able to “de-brief” the situation when the FAI receives epinephrine, so they are reassured that the event was handled appropriately, and the caregiver feels validated in the action taken. Future studies could easily address whether such an intervention could moderate QoL.

Although the primary outcome was to describe the relation between epinephrine use and caregiver QoL, the authors noted additional relations between QoL and other predictors queried in this

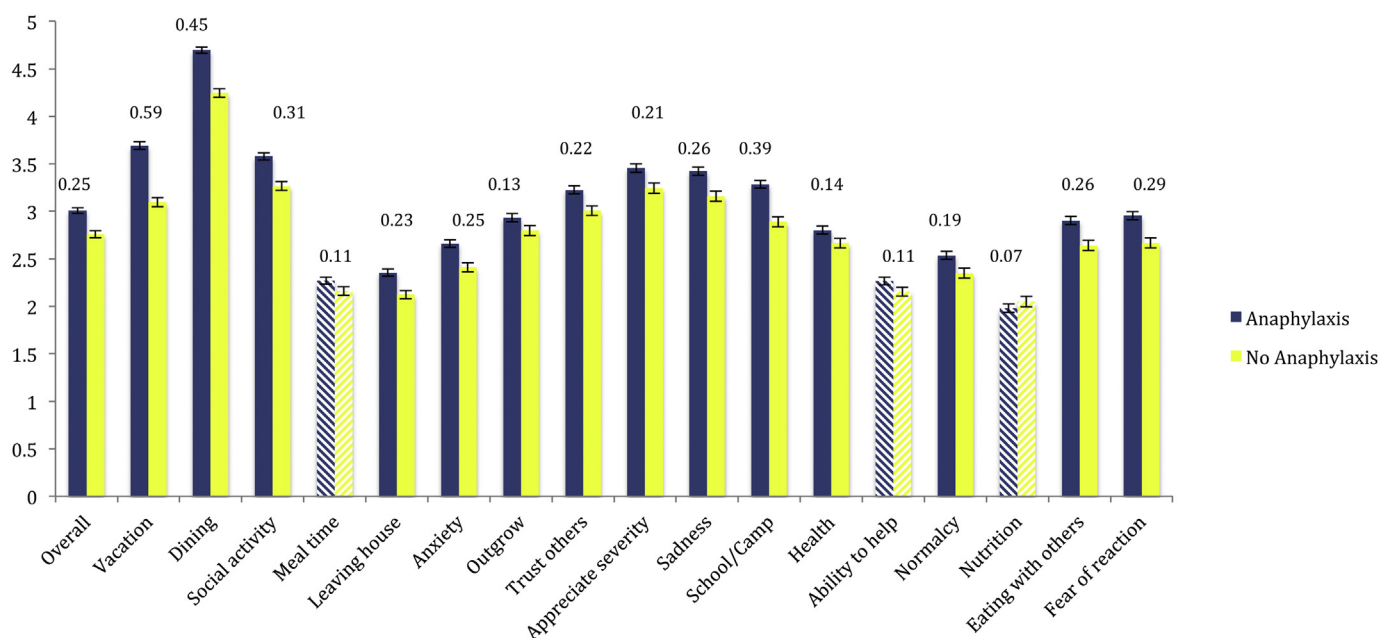


Figure 2. Effect of a history vs no history of anaphylaxis on mean Food Allergy Quality of Life–Parental Burden questionnaire score. The difference was statistically significant ($P < .05$) except for meal time, ability to help, and nutrition quality-of-life domains (striped bars). Mean difference for each domain is labeled. Error bars represent standard error.

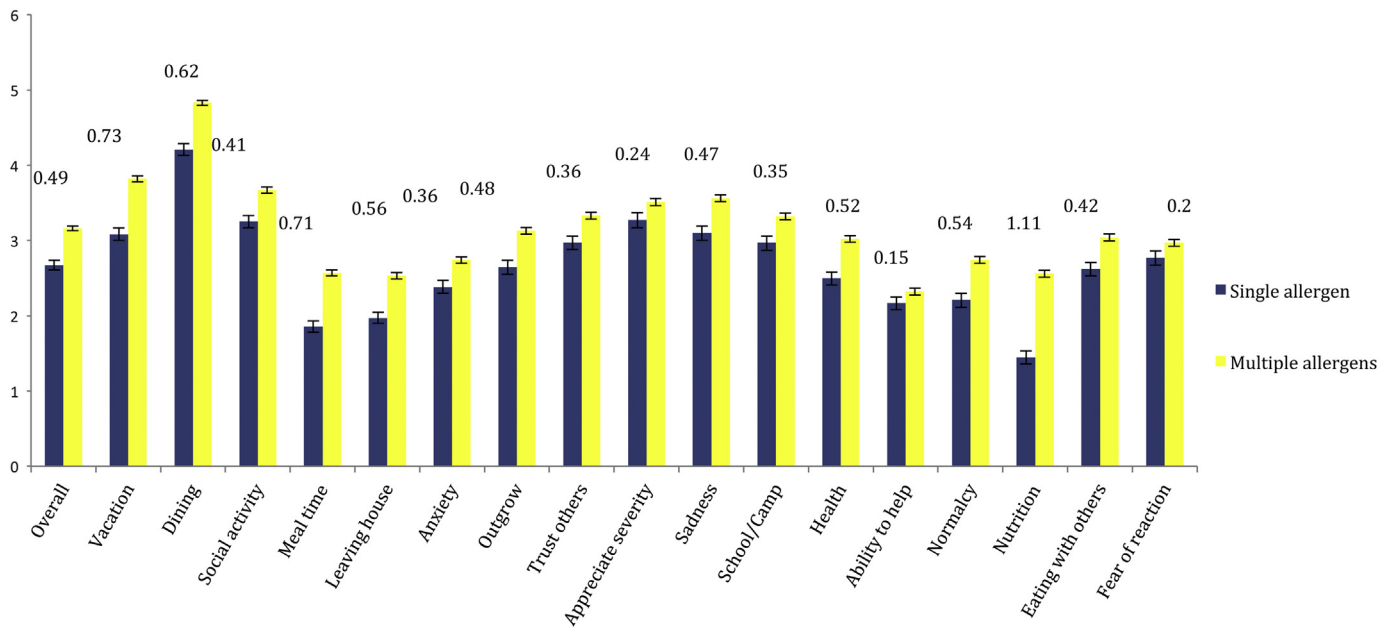


Figure 3. Effect of single food allergen versus multiple food allergens on mean Food Allergy Quality of Life–Parental Burden questionnaire score. The difference was statistically significant ($P < .05$) in all quality-of-life domains. Mean difference for each domain is labeled. Error bars represent standard error.

study. This study reconfirmed a previously noted negative effect for a reported history of anaphylaxis on QoL.^{12,17,20} It also reconfirmed a recently noted effect between QoL and allergen type, in that peanut or tree nut allergy was associated with lower (better) QoL compared with milk or egg, wheat or soy, and seafood allergy, respectively.³⁴ The authors hypothesize these allergens are associated with a higher (worse) QoL score relative to peanut or tree nut because they are more ubiquitously present in commercially sold foods and are more difficult to avoid. Advancing age in the present FAIs was associated with better

(lower) caregiver QoL score, which could imply some facet of acclimation or that QoL issues are simply more magnified with younger FAIs. However, in a study using a different QoL index, longer allergy duration was associated with worse QoL score.¹⁷ Additional factors associated with higher (worse) caregiver QoL score include having multiple FAIs and having FAIs with multiple food allergies, which have been noted previously, and support a detrimental association between an increased burden of vigilance (from multiple allergens or multiple allergic children) and caregiver QoL.^{12,17–22}

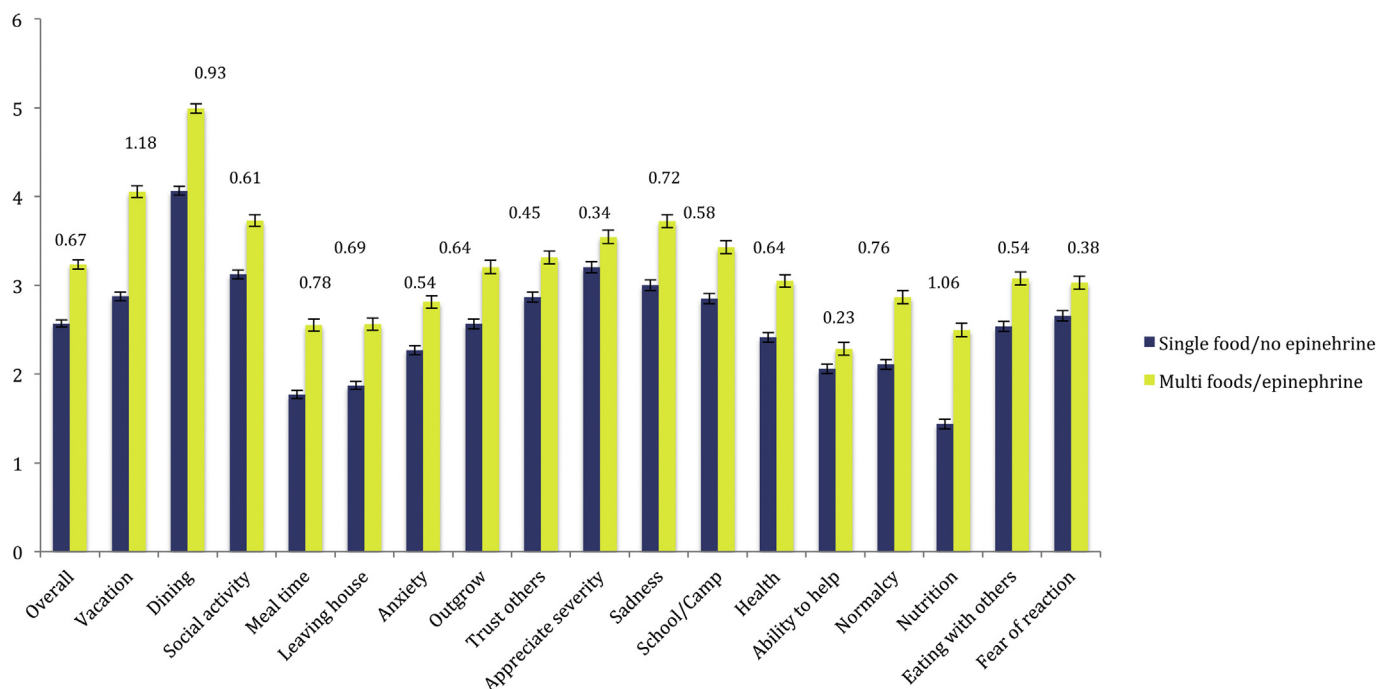


Figure 4. Effect of single food allergen and no history of epinephrine use vs multiple food allergens and history of epinephrine use on mean Food Allergy Quality of Life–Parental Burden questionnaire score. The difference was statistically significant ($P < .05$) in all quality-of-life domains. Mean difference for each domain is labeled. Error bars represent standard error.

Table 3Multiple regression analysis for factors predictive of Food Allergy Quality of Life—Parental Burden score^a

Quality-of-life score	Coefficient	P value	95% CI
Child has received epinephrine	0.46	.003	0.15–0.76
Child has had anaphylaxis	0.23	<.001	0.1–0.37
Child has had anaphylaxis and received epinephrine	–0.35	.04	–0.68 to –0.02
Child's current age	–0.05	<.001	–0.06 to –0.03
>1 Food-allergic child	0.27	.001	0.08–0.33
Type of food allergy (peanut or tree nut as reference)			
Egg or milk	0.27	<.001	0.13–0.42
Wheat or soy	0.52	<.001	0.33–0.72
Seafood	0.5	<.001	0.3–0.7
Caregiver college education	–0.15	.02	–0.28 to –0.02
Intercept	2.9	<.001	2.5–3.19

Abbreviation: CI, confidence interval.

^aModel also adjusted for age at time of reaction, race, income, geographic region, allergist making the initial diagnosis, asthma, eczema, membership in a support group, and epinephrine device training (all nonsignificantly associated with quality-of-life score). A higher score indicates worse quality of life.

This study has several limitations. Foremost, all attributes of food allergy were recorded entirely by caregiver report, and these data are subject to recall bias and possible challenges to validity. In addition, participants were recruited through social media tied to national advocacy groups, with more than 50% of caregivers reporting membership in at least 1 such group. This could infer some degree of selection bias. The membership variable was carefully adjusted for and was not found to be significant in regression analysis. This population might have potential differences in baseline QoL compared with individuals without a propensity to belong to food allergy advocacy or support groups or have differences in other baseline attributes, such as multiple FAIs or FAIs with multiple food allergies. However, there is no other feasible way beyond caregiver report to study food allergy at a national level, and there are no data to determine how the attributes of a caregiver-reported food allergic population compare with a population defined by the diagnostic gold standard of an oral food challenge. Moreover, this population might not have an accurate understanding of anaphylaxis, which can influence the self-reported results, although the authors were deliberately exploring the parental perception of anaphylaxis as opposed to probing specific knowledge of the National Institute of Allergy and Infectious Diseases definition of anaphylaxis. The FAQL-PB is a validated caregiver QoL index, but it lacks a specific MCID. Its creators used a generic MCID of 0.5 adapted in the analyses of other non-allergy HRQoL questionnaires comprised from a series of 7-point Likert items.^{31,32} However, this value is purely speculative, not specific for this index or disease, and therefore might not be the appropriate MCID for the FAQL-PB. Because no actual calculated MCID for the FAQL-PB exists, the authors did not disregard between-group differences less than 0.5 given that this might be shortsighted in the absence of a value specific to the FAQL-PB.³³ However, they judged that a value of 0.5 was appropriate for power analysis for an approximate effect. The present findings represent cross-sectional observational analysis and should not be used to make any longitudinal or causal inference. The FAQL-PB was validated in a very similar population to the present one (advocacy group members proxy-reporting allergy for their FAI), and the present population has similar attributes described in prior food allergy QoL studies (white FAIs, young reported age at reaction, predominance of peanut or tree nut allergy, reported household incomes >\$50,000, and most caregivers having at least a college education).^{12,17,18,20}

These data indicate that there is a potential detrimental effect on caregiver QoL in those reporting their FAIs had prior epinephrine

use. This potentially suggests that families reporting epinephrine use might be in need of additional support after an event, given the differences noted in QoL. Instructions to caregivers regarding treatment also should be straightforward and explained in great detail to make sure caregivers understand what to do and feel comfortable with the plan. Preliminarily, the authors speculate that the beneficial interaction effect noted with epinephrine use and reported anaphylaxis suggests empowerment, although they strongly caution this finding might be somewhat limited given that epinephrine usage and anaphylaxis are reported, not directly observed, events and QoL was not immediately assessed at the time of either event. Therefore, further prospective study is needed to compare baseline QoL with QoL after epinephrine use and re-verify any interaction effect. Expansion to a referral clinic population is needed, as is the evaluation and comparison of such findings with those from this caregiver-reported population.

In conclusion, this report presents novel, exploratory data suggesting that reported epinephrine auto-injector usage in a caregiver-reported food-allergic population might be associated with worse caregiver QoL, although this effect is conditionally modified by an interaction between caregivers and FAIs who have reported use of an auto-injector and a history of anaphylaxis, resulting in a better (lower) QoL score. This could represent empowerment of caregivers of FAIs who have received epinephrine in specific situations, but this requires future prospective study to better elaborate such effects and understand the potential influence of caregiver QoL on management of anaphylaxis.

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Supplementary Data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.anai.2014.12.022>.

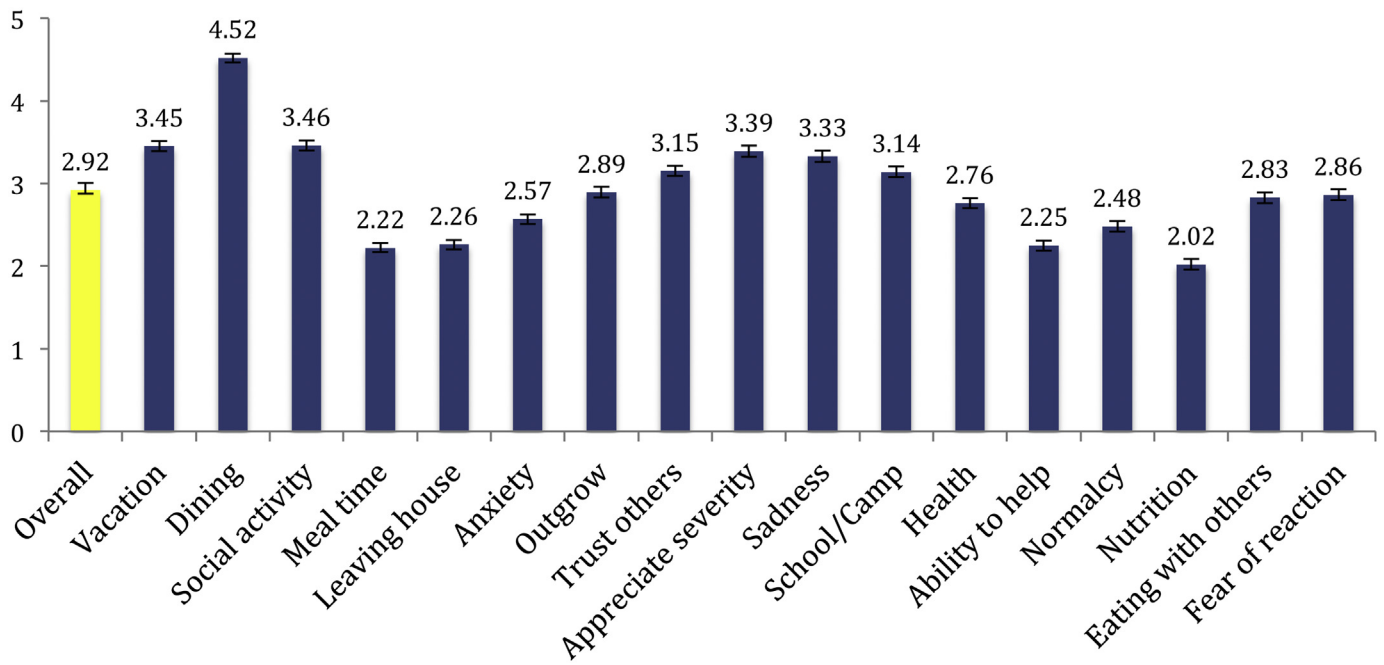
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Food Allergy Quality of Life – Parental Burden questionnaire (FAQL-PB)		0 Not troubled	1 Hardly troubled at all	2 Somewhat troubled	3 Moderately Troubled	4 Quite a bit troubled	5 Very troubled	6 Extremely troubled
1	If you and your family were planning a holiday/vacation, how much would your choice of vacation be limited by your child's food allergy?							
2	If you and your family were planning to go to a restaurant, how much would your choice of a restaurant be limited by your child's food allergy?							
3	If you and your family were planning to participate in social activities with others involving food (e.g. parties, holiday, etc) how limited would your ability to participate in social activities that involve food be because of your child's food allergy?							
IN THE PAST WEEK . . .								
4	. . . how troubled have you been by your need to spend extra time preparing meals (i.e. label reading, extra time shopping, preparing extra meals, etc.) due to your child's food allergy?							
5	. . . how troubled have you been about your need to take special precautions before going out of the home with your child because of their food allergy?							
6	. . . how troubled have you been by anxiety relating to your child's food allergy?							
7	. . . how troubled have you been that your child may not overcome their food allergy?							
8	. . . how troubled have you been by the possibility of, or actually leaving your child in the care of others because of their food allergy?							
9	. . . how troubled have you been by frustration over other's lack of appreciation for the seriousness of food allergy?							
10	. . . how troubled have you been by sadness regarding the burden your child carries because of their food allergy?							
11	. . . how troubled have you been about your child's attending school, camp, day care, or other group activity with children because of their food allergy?							
12	. . . how troubled have you been by your concerns for your child's health because of their food allergy?							
13	. . . how troubled with the worry that you will not be able to help your child if they have an allergic reaction to food?							
14	. . . how troubled have you been with the worry that your child will not have a normal upbringing because of their food allergy?							
15	. . . how troubled have you been about concerns for your child's nutrition because of their food allergy?							
16	. . . how troubled have you been with issues concerning your child being near others while eating because of their food allergy?							
17	. . . how troubled have you been with being frightened by the thought that your child will have a food allergic reaction?							

eFigure 1. Food Allergy Quality of Life—Parental Burden quality-of-life index.



eFigure 2. Mean total and domain-specific Food Allergy Quality of Life—Parental Burden quality-of-life scores.