



Letters

Associations between food allergy and perceived life status

Among families with a child who has a food allergy, maternal-perceived life status is lower than other family members, particularly if the child has allergies to peanut or tree nut and has severe symptoms.

As many as 8% of children live with a food allergy—a condition that substantially burdens children and their families.¹ Although food allergy–related burdens have been described in various ways,² no previous studies have described the burden of food allergy on all family members. Here, we consider the family burden by making use of visual analog scales (VAS) completed by the mother for all members of the family. These linear scales permit the measurement of subjective or behavioral phenomena, in which a participant selects from a gradient of alternatives.³ When the scale ranges from “worst possible life” to “best possible life,” these selections can be interpreted as perceived life status.⁴ Although VAS has been reliably used to assess the burden of other allergic diseases,^{5,6} no studies have used VAS to assess the perceived life status of the family of a child with food allergy. We aimed to describe the perceived life status of children with a physician-diagnosed food allergy, their parents, and other household members, with consideration to the number, type, and severity of food allergies and family composition.

This is a cross-sectional study of data collected from parents whose children aged 0 to 17 years were being followed up at tertiary care pediatric allergology clinics in Sweden. We excluded families whose children had other chronic health conditions. Families, represented by the mothers, completed the Swedish-language Food Allergy Economic Questionnaire, described elsewhere.^{7,8} Specific to this study, we used data from the 11-point VAS on a continuous scale from 0 (worst possible life) to 10 (best possible life). More importantly, respondents who were mothers had a similar VAS as respondents who were nonmothers (6.48 ± 1.93 vs 6.45 ± 1.68 ; $P = .89$). The mothers completed the VAS for themselves and on behalf of all the household members and also provided the demographic data of all household members, including monthly household income. From this information, we calculated the household size, the number of adults (18+ years) and children (<18 years), and the number of children younger than the child with food allergy. The mothers also provided information on any history of allergic diseases, including the number and types of food allergy and the presence of asthma, atopic dermatitis, and rhinitis for all household members. From this information, we created a variable of “number of food allergies” with mutually exclusive categories of 1 to 3, 4 to 6, or 7 or more food allergies

based on the distribution of our data. The mothers also reported if their child had any previous food allergic symptoms, from which we created a binary variable of mild vs severe symptoms (loss of consciousness and, or bladder control).

The characteristics of all household members were described. Analytical statistics included linear regression, the regression coefficient (β), and 95% confidence intervals (CIs), with $P < .05$ considered statistically significant using Stata 15.1 (StataCorp LLC, College Station, Texas). A priori confounding variables included the child’s age, any other atopic diseases, family size, and monthly income. This study was granted ethical approval (DNR 2009/84-31; DNR 2016/436-32). Personal information was handled according to the Swedish Ethical Review Act of 2003 and the European Union’s General Data Protection Regulation.

In our study population of 123 who were mothers (mean age, 40.3 ± 6.9 years), 14.6% were single parents and 36.4% of mothers had food allergy themselves (eTable 1). On average, households were composed of 2 adults and 2 children (range, 2–6). Of the children with food allergy (mean age, 9.5 ± 4.7 years), there were more boys than girls (69.7% vs 30.3%, respectively). Although approximately 30% of children with food allergies have multiple food allergies,⁹ most children in our study had multiple food allergies, 78.3% with 7 or more food allergies. Similarly, most children also had reports of other atopic diseases, of which asthma was the most common (74.3%).

The perceived life status of the responding mother was 6.48 plus or minus $1.93/10$, which is significantly lower than that for other household members ($P < .001$) and approached, but did not reach, statistical significance for spouses ($P < .08$) and the child with food allergy ($P = .12$). Thus, our findings support that food allergy–related behaviors are negatively associated with the mothers’ perceived life status, in contrast with a recent report stating that mothers claimed a greater sense of empowerment in their ability to manage the food allergy and treat any food allergic reactions than fathers of children with food allergy.¹⁰

The number of food allergies the child had was not associated with the perceived life status of the mother (Table 1), spouse (if applicable), or the children in fully-adjusted models. Similarly, severe symptoms were not associated with worse perceived life status for mothers (β , -0.98 ; 95% CI, -2.02 to 0.06).

Nearly all children in our study had multiple food allergies, which permitted the examination of whether the type of food allergies was associated with perceived life status in ways other than simply the presence of multiple food allergies. Although allergies to milk and egg were not associated with the perceived life status of any family member in the fully-adjusted models (results not indicated), allergies to milk plus peanut or tree nut were significantly associated with the worse perceived life status for the mother (β , -0.82 ; 95% CI, -1.44 to -0.21 ; $P < .02$) (Table 1) and for the child (β , -0.73 ; 95% CI, -1.28 to -0.17 ; $P < .01$), compared with allergies to milk but not peanut or tree nut. This observation may reflect the

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Table 1
Perceived Life Status of Mothers Based on Allergic Characteristics of the Child and of Family Composition

	N	Unadjusted		Model 1 ^a		Model 2 ^b	
		β	95% CI	β	95% CI	β	95% CI
Number of food allergies							
1–3	14	Ref		Ref		Ref	
4–6	12	–0.03	–1.49 to 1.44	0.52	–1.42 to 2.46	0.32	–1.63 to 2.27
7+	97	–1.54^c	–2.62 to 0.45	–0.85	–2.41 to 0.71	–0.62	–2.29 to 1.06
Milk and egg							
Child not allergic to milk or egg	21	Ref		Ref		Ref	
Child allergic to milk or egg	102	–0.30	–1.26 to 0.67	–0.04	–1.35 to 1.27	0.18	–1.07 to 1.42
Milk							
Child not allergic to milk	17	Ref		Ref		Ref	
Child allergic to milk	106	–1.22	–2.04 to 0.54	–0.75	–2.04 to 0.54	–0.51	–1.88 to 0.85
Egg							
Child not allergic to egg	11	Ref		Ref		Ref	
Child allergic to egg	33	–1.00	–2.25 to 0.25	–0.15	–1.88 to 1.57	0.16	–1.78 to 2.10
Milk and egg							
Child not allergic to milk or egg	21	Ref		Ref		Ref	
Child allergic to milk or egg	102	–0.30	–1.26 to 0.67	–0.04	–1.35 to 1.27	0.18	–1.07 to 1.42
PN or TN							
Child not allergic to PN or TN	40	Ref		Ref		Ref	
Child allergic to PN or TN	75	–0.56	–1.30 to 0.19	–0.68	–1.72 to 0.62	–0.56	–1.58 to 0.46
Milk and PN or TN							
Child allergic to milk, not PN or TN	14	Ref		Ref		Ref	
Child not allergic to milk, allergic to PN or TN	42	–0.84^c	–1.36 to –0.32	–0.79^c	–1.43 to –0.15	–0.82^c	–1.44 to –0.21
Family members with food allergy							
Child only	43	Ref		Ref		Ref	
Parent + child	80	0.04	–0.72 to 0.80	–0.05	–0.98 to 0.88	–0.13	–1.09 to 0.84
Severe symptoms							
No severe symptoms	56	Ref		Ref		Ref	
Severe symptoms	37	–0.51	–1.31 to 0.29	–0.47	–1.49 to 0.56	–0.98	–2.02 to 0.06
Younger children in the household							
Only child	30	Ref		Ref		Ref	
Younger children only	36	–0.17	–1.14 to 0.81	–0.43	–1.63 to 0.77	0.00	–1.33 to 1.34
Some older children	47	0.41	–0.52 to 1.33	0.35	–0.77 to 1.47	0.91	–0.44 to 2.25

Abbreviations: β , regression coefficient; PN, peanut; Ref, reference; TN, tree nut.

NOTE: Bold values are statistically significant.

^aAdjusted for a child's age and any other atopic diseases.^bAdjusted for a child's age, any other atopic diseases, family size, and monthly income.^c $P < .05$ was considered statistically significant.

popularity of milk and milk products in the Swedish diet, which makes them difficult to avoid. The potential for severe reactions to peanut or tree nut may cause further increased anxiety. As such, this combination may be particularly burdensome on daily life. Perceived life status was comparable for the households in which only the child had a food allergy and the households in which both the parent and the child had a food allergy, considering the ages of the children.

Thus, we conclude that the perceived life status is worse among mothers than other family members and among mothers whose children are allergic to milk and peanut or tree nut.

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Supplementary DataSupplementary data related to this article can be found at
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Supplementary Data

eTable 1

Characteristics of the Mother, Household Members, and the Child

	n	%
Mothers (n = 123)		
Food allergy (n = 150)	40	36.4
Single Parent	18	14.6
Age (n = 66)	40.3 ± 6.9	
Household characteristics		
Household size		
Adults	2.0 ± 0.6 (1-4)	
Children	2.0 ± 0.8 (1-4)	
Total	4.0 ± 0.9 (2-6)	
Monthly income (USD ^a ; n = 172)	4857 ± 1959	
Child characteristics		
Sex (n = 109)		
Boys	76	69.7
Girls	33	30.3
Number of food allergies (n = 115)		
1-3	13	11.3
4-6	12	10.4
7+	90	78.3
Age	9.5 ± 4.7	
Other atopic diseases		
Asthma (n = 105)	78	74.3
Dermatitis (n = 97)	60	61.8
Rhinitis (n = 95)	59	61.2

Abbreviation: SEK, Swedish Krona; USD, United States dollars.

^aConverted from SEK to USD using an exchange rate of 1 SEK to 0.107 USD.