

Implications of Social Support and Parenting Self-Efficacy for Food Allergy-Related Parenting Practices

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Little is known regarding factors that influence parenting behaviors specific to the management of food allergies in elementary school-aged children. The aim of this study was to identify child characteristics and parent psychosocial factors associated with food allergy-related parenting practices. Participants included 182 parents of food allergic children aged between 5 and 11 years recruited from parent support groups. Data were collected using web-based questionnaires. Multiple regression analyses were conducted to identify predictors of food allergy-related parenting practices. Predictor variables examined included child demographic and allergy characteristics, parent perceived social support, and parenting self-efficacy (ie, parental beliefs specific to their ability to influence their child's behavior and development). The interaction between social support and parenting self-efficacy was examined to test for moderation. Having an older child and more social support were associated with significantly less parental monitoring ($b = -0.076$ and -0.013 , $P < 0.001$), but more support for children's self-management of their food intake ($b = 0.087$ and 0.015 , $P < 0.001$) and more use of strategies that attempt to teach children how to handle allergic exposures ($b = 0.290$ and 0.028 , $P < 0.05$). Higher levels of parenting self-efficacy were associated with more support for children's self-management of food intake ($b = 0.031$, $P < 0.001$). Parenting self-efficacy was not a significant moderator of the effects of social support on parenting practices. Social support and parenting self-efficacy may influence parenting practices in families with food allergic children and merit consideration in psychosocial interventions addressing allergy-related parenting practices.

Introduction

FOOD ALLERGY is a prevalent health condition affecting up to 8% of children below the age of 18 years.^{1,2} Exposure to food allergens can lead to life-threatening reactions, and emergency department visits due to food-induced anaphylaxis are increasing.^{3,4} Parenting represents a behavioral factor that can reduce the risk for allergic exposures during childhood. Parents assume the primary role in daily allergy management activities for young children and facilitate the transition to increased food allergy self-management for older children and adolescents. Parenting is widely regarded as a prominent influence on the well-being for children with chronic illness; yet, a paucity of empirical research focuses on parenting children with food allergy.

A prior investigation identified three categories of parenting practices relevant in the management of children's food allergies.⁵ These included parental monitoring of children's food consumption and food-related activities, providing support for children's self-management of food intake, and teaching children how to manage allergic re-

actions resulting from exposure to food allergens. Evidence suggests that parents monitor younger children more closely and allow older children more autonomy to manage their allergy independently.^{5,6} In addition, allergy characteristics that affect parental coping and ratings of health-related quality of life, such as the presence of multiple food allergies and potential for and/or history of anaphylactic or severe allergic reactions,⁷⁻⁹ have been associated with increased parental monitoring of children's food consumption and food-related activities.⁵ Little is known regarding social and psychological factors that impact these parenting behaviors.

Social support is a consistent predictor of psychosocial outcomes in families coping with childhood disabilities and chronic health conditions,^{10,11} and has recently been associated with parental adaptation to pediatric food allergy.¹² Social support can include directly sharing in responsibilities of caring for the child as well as providing emotional support. As such, it may influence food allergy-related parenting practices directly (eg, tangible assistance with allergy management tasks) as well as indirectly (eg,

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alleviation of emotional distress/burden, thereby increasing parents' ability to provide care).

A second potential psychosocial influence on food allergy-related parenting behaviors is parenting self-efficacy, defined as parents' perceptions of their ability to positively influence the behavior and development of their children.^{13,14} Parents who hold strong beliefs of their own parenting efficacy have been found to exhibit parenting behaviors, skills, and strategies that promote positive and adaptive child development and outcomes (eg, maternal warmth and sensitivity, verbal communication, and parental involvement and monitoring).^{13,15} In addition to having a direct effect, parenting self-efficacy could also influence parenting practices through its interaction with other factors. For example, high levels of parenting self-efficacy may serve as a protective factor against negative outcomes for parents who experience low social support. If so, enhancing parents' self-efficacy beliefs specific to child rearing may be an important goal for interventions targeting parents of food allergic children.

The present study aimed to improve the understanding of factors that may account for variations in parenting behaviors among caregivers of children with food allergy. The first objective was to identify predictors of allergy-related parenting practices. Specific predictors examined were (1) child characteristics (age, gender, and allergy parameters), (2) parents' perceptions of the extent of social support they receive for caregiving, and (3) parenting self-efficacy. We hypothesized that parents would report less monitoring but more autonomy support and emergency education with older children. We also expected that parents of children with multiple food allergies and more past use of epinephrine would report more monitoring and emergency education, but report less support for autonomy. With respect to our psychosocial predictors, we anticipated that parents who reported higher levels of social support and self-efficacy would report more use of all three parenting behaviors. The second objective was to determine whether parenting self-efficacy moderates the effect of social support on parenting practices. We expected that social support and parenting self-efficacy would interact in the prediction of parenting behaviors, with stronger associations between social support and parenting behaviors observed in the context of high levels of parenting self-efficacy.

Materials and Methods

Participants

Participants included 182 primary caregivers of food allergic elementary school-aged children aged between 5 and 11 years. This sample represents a subgroup drawn from a larger study ($N=345$) investigating the psychological and social aspects of childhood food allergy in families with food allergic children aged between 0 and 18 years. Surveys were completed in 2013 over a 6-month time frame. Participants with children younger than 5 years of age were excluded from the current sample because the measure used to assess our primary outcome of food allergy-related parenting practices was not designed to be completed by parents with infants, toddlers, or preschool-aged children. Participants with children older than age 11 years were excluded due to the differing developmental needs and experiences of preadolescents and adolescents compared with elementary school-aged children. Participants were recruited from parent support groups

associated with Food Allergy Research & Education, a United States-based 501(c)(3) nonprofit organization that was formed as the result of a merger between the Food Allergy & Anaphylaxis Network and the Food Allergy Initiative. Eligibility criteria specified that participants must be adult (older than 18 years of age) primary caregivers (defined as the parent who assumes the greatest responsibility for the daily care of the child) to children (aged between 0 and 18 years of age) with one or more food allergies. Caregivers were invited to participate regardless of race/ethnicity and gender.

Measures

Parents completed a questionnaire to collect information regarding their sociodemographic background (age, marital status, level of education, and race/ethnicity). Questionnaire items also pertained to their child (age and gender) and their child's food allergy (age at diagnosis, number and type of food allergies, method of diagnosis, and total number of past administrations of autoinjector epinephrine across various individuals involved in the child's care, including parents, teachers/child care providers, relatives, friends, and health-care providers).

The Food Allergy Parenting Practices Questionnaire was used to assess parenting behaviors.⁵ This questionnaire contains 20 items assessing a wide range of possible parenting behaviors that may occur in the context of raising a child with food allergy. Respondents rate how frequently each of the items is true for them on a 5-point Likert scale (1 = *never* and 5 = *always*). This measure yields three subscales: (1) Protection/Monitoring: the extent to which parents assume responsibility and control over their children's allergy management; (2) Autonomy Support: behaviors that support children developing skills to function with autonomy and without direct parental involvement; and (3) Emergency Education: behaviors aimed at teaching children about issues related to maintaining safety in the event of an allergic reaction. To derive scale scores, individual items on the scales are summed and divided by the total number of items included in the scale. The three scales have been shown to have acceptable internal reliability in a prior sample, with alphas of 0.79, 0.73, and 0.82, respectively.⁵ Alphas for the current study sample are reported in Table 2.

Parents' perceptions of social support related to caring for their child were measured using the Perceived Social Support for Caregiving scale, a 12-item questionnaire that yields two scales: Social Support (9 items) and Social Conflict (3 items, scale not used in the present study).¹⁶ Items loading on the Social Support scale assess aspects of self-help support, information exchange, and emotional support provided to individuals with respect to their caregiving activities. For the purposes of the present study, the measure was adapted slightly so that items referenced food allergy (ie, "Others I know help me deal with the frustrations I have as a result of being a caregiver to a child with food allergy"). Scores are calculated by summing the 9 social support scale items to provide a total continuous score that can range from 9 to 42. Higher scores indicate higher social support. This measure has been shown to be a reliable and valid measure with internal consistency for the Social Support scale at $\alpha=0.84$. The alpha for the current study sample was 0.91.

The Parenting Sense of Competence Scale was used to assess parenting self-efficacy.^{14,17} This is a widely used and

well-validated parenting scale consisting of 16 self-report items, each rated on a 6-point Likert scale, ranging from 1 (*strongly agree*) to 6 (*strongly disagree*). The measure yields two subscales: Efficacy and Satisfaction, but only the Efficacy subscale (comprised of 7 items) was examined in the present study. The Efficacy subscale reflects parents' perceptions of their parenting competence, problem-solving ability, and capability in the parenting role, with higher scores indicating higher parenting self-efficacy. Scores are calculated by summing responses to items, resulting in a total continuous score that can range from 7 to 42, with higher scores indicative of higher parenting self-efficacy. The alpha for the Efficacy scale in the current study sample was 0.84.

Procedures

Participants were recruited via study announcements posted by Food Allergy Research & Education support group leaders on their Facebook group pages. Individuals interested in participation were guided to a secure online forum for survey administration, where they were presented with an informed consent statement that provided information about the study. Participants who wished to volunteer for the study indicated their informed consent by clicking "I agree," after which they were presented with study questionnaires. The survey was anonymous and took ~20 min to complete. This study was reviewed and approved by the institutional review board at the university where the study was conducted.

Statistical approach

Analyses to examine predictors of parenting practices, including the interaction between social support and parenting self-efficacy, were conducted in a multiple regression framework using the PROCESS macro for SAS.¹⁸ This macro uses ordinary least squares regression to estimate direct and indirect effects in moderation models and provide simple slopes and regions of significance for probing interactions. The current analysis was conducted using 5,000 bootstrapped samples. Before conducting the regression analyses, the bivariate associations of mothers' socio-demographic characteristics to parenting practices were examined to determine whether they should be included as covariates in the models. For these preliminary analyses, categorical demographic variables were collapsed into two-level indicator variables due to the small numbers of participants within some groups. Maternal age and education were positively correlated with Emergency Education and consequently were included as covariates in the regression model predicting this parenting practice. Likewise, maternal age was included as a covariate in the regression model predicting Protection/Monitoring.

Each parenting practice (Protection/Monitoring, Autonomy Support, or Emergency Education) served as the dependent variable in separate models. Predictors included covariates (if applicable), child age, child gender, total number of food allergies, number of prior epinephrine administrations, social support for caregiving and parenting self-efficacy. Moderation was tested by examining whether parenting practices were predicted by the interaction between social support and parenting self-efficacy. Social support and parenting self-efficacy were centered before creating the interaction term.

Results

Sample characteristics

Data were analyzed for 182 primary caregivers (98.4% mothers) and their school-age children. Characteristics of respondents and their children are presented in Table 1. The majority of respondents were Caucasian, married, and had at least a college degree. On average, respondents were 39.40 years [standard deviation (SD) = 4.93]. Children (53% girls)

TABLE 1. SAMPLE CHARACTERISTICS (N = 182)

Variable	n (%)	M (SD)	Range
Parent age (years)		39.40 (4.93)	27–52
Race/ethnicity			
Asian or Pacific Islander	8 (4.40)		
Black/African American	2 (1.10)		
Caucasian	158 (86.81)		
Hispanic	4 (2.20)		
Native American	2 (1.10)		
Other ^a	8 (4.40)		
Marital status			
Single, never married	5 (2.75)		
Married	171 (93.96)		
Legally separated or divorced	5 (2.75)		
Widowed	1 (0.55)		
Educational attainment			
High school diploma or less	7 (3.85)		
Some college or college degree	106 (58.24)		
Some graduate school or graduate degree	69 (37.91)		
Child gender			
Male	85 (46.70)		
Female	97 (53.30)		
Child age (years)		7.42 (1.90)	5–11
Number of food allergies reported		2.87 (1.66)	1–8
1	35 (19.23)		
2	60 (32.97)		
3	39 (21.43)		
4	18 (9.89)		
5	12 (6.59)		
6	10 (5.49)		
7	6 (3.30)		
8	2 (1.10)		
Type of food allergy ^b			
Peanut	158 (86.81)		
Tree nut	138 (75.82)		
Cow's milk	56 (30.77)		
Soy	26 (14.29)		
Wheat	17 (9.34)		
Eggs	76 (41.76)		
Fish	19 (10.44)		
Shellfish	32 (17.58)		
Times administered autoinjector epinephrine	0.55 (1.18)	0–7	

^aIncludes participants identifying as multiracial.

^bDoes not total 100% due to multiple allergies endorsed. SD, standard deviation.

TABLE 2. DESCRIPTIVE STATISTICS FOR THE MAJOR STUDY VARIABLES ($N=182$)

Variables	M	SD	α	Potential	Range	
					Actual	Skew
Predictor						
Social support ^a	32.21	7.46	0.91	9–45	9–45	–0.42
Parenting self-efficacy ^b	30.84	5.19	0.84	7–42	11–42	–0.48
Criterion ^c						
Protection/monitoring	3.81	0.39	0.58	1–5	2.75–4.75	–0.24
Autonomy support	4.03	0.59	0.91	1–5	2.11–5.00	–0.55
Emergency education	3.30	1.23	0.77	1–5	1.00–5.00	–0.39

^aParticipants responded to items using a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

^bParticipants responded to items using a 6-point Likert scale, ranging from 1 (*strongly agree*) to 6 (*strongly disagree*).

^cParticipants responded to items using a 5-point Likert scale, ranging from 0 (*never*) to 4 (*always*).

ranged in the age from 5 to 11 years [mean (M)=7.42, $SD=1.90$]. Most respondents (80.8%) had a child with multiple food allergies ($M=2.87$, $SD=1.66$). The most commonly reported child food allergies were peanut (86.81%), tree nut (75.82%), eggs (41.76%), and cow's milk (30.77%).

Descriptive statistics for the major study variables are shown in Table 2. The mean score on social support is generally consistent with what was reported in the Perceived Social Support for Caregiving (PSSC) validation study focusing on individuals' caring for adults with Alzheimer's disease.¹⁶ On average, parents reported moderate to high levels of social support ($M=32.21$, $SD=7.46$). The mean score on self-efficacy ($M=30.84$) is higher than the mean reported for mothers in the validation study sample ($M=25.27$ across mothers of boys and girls ages 4–6 and 7–9 years).¹⁴

Predictors of parenting practices

Results of the regression analyses are presented in Table 3. The overall model predicting parents' use of Protection/Monitoring was significant ($F(8, 173)=6.92$, $P<0.0001$) and accounted for 24% of the variance in Protection/Monitoring scores. Two significant main effects were observed after controlling for parent age. Higher use of Protection/Monitoring was associated with younger child age (unstan-

dardized coefficient= -0.076 , $P<0.0001$) and lower levels of social support (unstandardized coefficient= -0.013 , $P<0.001$). The interaction between social support and parenting self-efficacy was not a significant predictor of Protection/Monitoring (unstandardized coefficient= -0.001 , n.s.). Thus, parenting self-efficacy did not moderate the direct association of social support to Protection/Monitoring.

The overall model predicting parents' use of Autonomy Support was significant ($F(7, 174)=5.47$, $P<0.0001$) and accounted for 18% of the variance in Autonomy Support. Three significant main effects were observed. Higher use of Autonomy Support was associated with older child age (unstandardized coefficient= 0.087 , $P<0.0001$) and higher levels of social support (unstandardized coefficient= 0.015 , $P<0.05$). A significant main effect for parenting self-efficacy was also observed, such that higher parenting self-efficacy was associated with more use of autonomy supportive parenting practices (unstandardized coefficient= 0.031 , $P<0.001$). Results did not support a moderating role of parenting self-efficacy in the prediction of Autonomy Support from social support.

Finally, the overall model predicting parents' use of Emergency Education was significant ($F(9, 172)=6.19$, $P<0.0001$) and accounted for 24% of the variance in Emergency Education scores. After controlling for parent age and education, a significant main effect of child age was observed

TABLE 3. SUMMARY OF REGRESSION ANALYSES PREDICTING PARENTING PRACTICES ($N=182$)

Predictor	Protection/monitoring ^a			Autonomy support			Emergency education ^b		
	b	se	t	b	se	t	b	se	t
Child age	–0.076	0.015	–5.14****	0.087	0.022	4.02****	0.290	0.046	6.27****
Child gender	0.040	0.053	0.75	–0.005	0.083	–0.06	–0.188	0.167	–1.13
Number of food allergies	0.036	0.016	2.25*	–0.018	0.025	–0.76	–0.046	0.050	–0.72
Prior use of epinephrine	0.002	0.023	0.07	–0.034	0.035	–0.95	–0.061	0.071	–0.86
Social support	–0.013	0.004	–3.47***	0.015	0.006	2.56*	0.028	0.011	2.44*
Parenting self-efficacy	–0.003	0.005	–0.47	0.031	0.008	3.74***	0.016	0.016	0.97
Social support X PSE	–0.001	0.001	–1.16	0.000	0.001	0.01	–0.001	0.002	–0.53
<i>F</i>	6.92****			5.47****			6.19****		
<i>R</i> ²	0.24			0.18			0.24		

Unstandardized regression coefficients reported.

^aAnalyses controlled for maternal age.

^bAnalyses controlled for maternal age and education.

* $P<0.05$, ** $P<0.01$, *** $P<0.001$, **** $P<0.0001$.

PSE, parenting self-efficacy.

such that parents reported more use of Emergency Education with older children (unstandardized coefficient = 0.290, $P < 0.0001$). Social support was also positively associated with parents' use of Emergency Education (unstandardized coefficient = 0.028, $P < 0.05$). The interaction between social support and parenting self-efficacy was not a significant predictor of Emergency Education (unstandardized coefficient = -0.001, n.s.).

Discussion

This study investigated child characteristics, allergy parameters, and maternal psychosocial variables in relation to parenting practices specific to caring for children with food allergies. As expected, having an older child and more social support was associated with less parental monitoring, but more support for children's self-management of their food intake and use of strategies that attempt to teach children how to handle allergic exposures. Higher levels of parenting self-efficacy were also associated with more support for children's self-management of food intake. Contrary to our hypothesis, no evidence was found for a moderating effect of parenting self-efficacy on the relationship of social support to parenting practices.

The important role of child age in parenting practices is consistent with previous findings and results from a qualitative study in which parents recognized the need to lessen supervision and shift some responsibility for allergy avoidance to their child as he/she became able to understand the implications of food allergy.⁸ However, in contrast to our hypotheses as well as a prior investigation,⁵ allergy parameters did not play a major role in parenting practices in the present study. We found no evidence that the frequency of past use of epinephrine influences parenting practices. We speculate that this unexpected result may be due to the lack of variability in this allergy parameter in the current sample, as 71% reported no prior administrations of autoinjector epinephrine and an additional 17% reported only one prior administration. The only significant finding pertaining to allergy parameters was that the total number of food allergy diagnoses was associated with parents' use of protection/monitoring. It may be that the presence of multiple food allergies alone is not enough to necessitate greater use of autonomy support or emergency education. Other factors that are more salient in terms of child risk, such as severity of the reaction resulting from allergen exposure, may be stronger determinants of these parenting practices due to the potential physical consequences of unintentional exposures. Future studies utilizing clinic samples that include greater numbers of children who have medically documented anaphylactic or severe allergy reactions are needed to explore this possibility.

The level of support parents receive in caring for their food-allergic child appears to play an important role in their parenting behaviors. Parents who perceive a high level of social support for caregiving reported engaging in more autonomy support with their children, but less protection/monitoring. Because social support includes not only emotional support but also tangible assistance in caretaking provided by others to the child's primary caregiver (eg, in food allergy, spouses, grandparents, nannies, siblings have all been identified as individuals involved in allergy management⁸), it may be that sharing the burden of protection/monitoring responsibilities with other trusted caregivers causes parents to per-

ceive less need to engage in protection/monitoring practices themselves. In addition, parents with higher levels of social support may perceive that their child has greater support in managing his/her safety in their absence and may thus be more likely to encourage the child to assume a more active role in self-managing their food allergy. Evaluating parents' level of social support for caregiving and assisting those with low support to enhance their social support networks may be an important goal for practitioners working with this population. In addition, future research addressing how specific aspects of perceived social support such as the type of social support received and source of support (eg, support group, spouse, relative, healthcare provider) relate to parenting behaviors is needed.

A novel contribution is that we examined parenting self-efficacy in relation to food allergy-related parenting practices. Our findings revealed that parenting self-efficacy was a significant predictor of parents' use of autonomy support. In general, parents with high parenting self-efficacy are confident in developing and demonstrating effective parenting skills¹⁵; thus, parents of food allergic children with high self-efficacy may feel more confident in their ability to effectively teach their children to self-manage their food intake. Increasing parenting self-efficacy may be an important goal for interventions targeting parents of children with food allergy. In this study, parenting self-efficacy was also explored as an effect modifier of the relationship between social support and parenting practices, but interaction effects were not substantiated. It is possible that parenting self-efficacy serves as a mediator rather than moderator of these associations.^{19,20} Longitudinal studies examining social support and parenting self-efficacy in relation to the parenting practices of food-allergic children are needed to explore this possibility.²¹

Limitations of this study include self-selection bias, which could result in a sample that is not representative of the larger population of parents with respect to child food allergies, interpersonal relationships, or parenting experiences. For example, the mean for parenting self-efficacy in our sample was higher than the mean reported in previous samples that are more diverse with respect to parental age and socioeconomic status. Our sample of primarily Caucasian, well-educated, and married mothers is also not representative of all families with food allergic children in terms of race/ethnicity, family structure (eg, married parent versus a single parent), or parents' educational attainment and age. A recent review of the food allergy literature highlighted the paucity of research that has included racial and ethnically diverse samples.²² There is a pressing need for future studies to include more heterogeneous samples that represent the broader population of families with food allergic children.

Findings should also be interpreted in light of our recruitment from food allergy support groups. Parents involved in support groups may experience greater difficulties with food allergy management and require more support than caregivers who are not involved with such groups. It is also possible that parents who participate in support groups may have more resources and support before becoming involved in the group compared with other parents; the sociodemographic profile of our sample (ie, highly educated, Caucasian, married) suggests that this may be the case. Another limitation is our reliance on self-report questionnaire completed by only one parent, which included asking parents to report on child allergies. Medical records would

likely provide more reliable data and greater detail regarding allergy diagnoses and treatment. As such, an important next step for this research is to replicate our findings in smaller, clinic-based sample. Finally, our cross-sectional data do not allow us to determine how the observed relationships function over time.

Conclusions and Clinical Implications

This study makes a novel contribution to the literature examining the practical implications of social and behavioral issues in food allergy. Our results highlight social support and parenting self-efficacy as two potential influences on three broad aspects of food allergy-related parenting behaviors. Based on the present results, it is recommended that professionals working with families of food-allergic children evaluate parents' perceptions of available social support and guide those with low support to build positive social support networks. It may also be beneficial for clinicians to consider how parents' beliefs about their ability to impact their food-allergic child's health and development affect specific food allergy management skills and adherence outcomes. Improvement in skills directly relevant to caregivers' adherence to allergy management plans is a frequently addressed clinical need of families learning to effectively manage pediatric food allergies. Evaluating how perceptions of parenting self-efficacy translate to specific food allergy adherence behaviors may yield useful information to guide behavioral interventions in clinical care settings and lead to improved child health outcomes.

Author Disclosure Statement

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