

A randomized controlled trial to reduce food allergy anxiety about casual exposure by holding the allergen: TOUCH study

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Clinical Implications

- Both education about the low risk of casual exposure and education in addition to having the patient touch peanut/nut reduced patient and parent worry about being near or touching their allergen.

TO THE EDITOR:

Peanut and tree nut allergies impact quality of life.¹ Patients often fear casual exposure, including airborne and skin contact, which are unlikely to cause a severe reaction.² Teenagers in one study indicated that touching their allergen was higher risk than some ingestion exposures.³ However, skin contact does not typically cause systemic reactions.^{4,5} In a study by Wainstein et al,⁴ a gram of peanut butter was placed for 15 minutes on the skin of 281 children who were skin prick test positive to peanut with no systemic reactions. In a double-blind, placebo-controlled study by Simonte et al,⁵ 30 children with a history of a severe reaction to peanut were challenged to sniff and touch peanut butter. No child experienced respiratory or systemic symptoms. Experts recommend that practitioners educate patients regarding the relative danger of ingestion versus casual allergen exposure.^{2,6} To decrease fear regarding casual exposure, Children's Mercy Hospital offers proximity challenges whereby a jar containing the allergen is brought increasingly closer to the allergic child.⁷ If there is no reaction, a contact challenge is done whereby a dab of the allergen is placed onto the skin. No patient in the practice experienced a systemic reaction.⁷ However, the physicians in this practice did not report outcomes or compare this approach to other methods.

We hypothesized that a behavioral intervention in which patients are instructed to touch their allergen, along with verbal education about the low risk of casual exposure, would result in a greater reduction of patient worry compared with verbal education alone. We also hypothesized as secondary outcomes that parental worry would decrease and there would be a lasting positive impact on comfort with casual exposure, anxiety, and quality of life.

We conducted a prospective, randomized controlled trial in a pediatric food allergy practice in New York, the Jaffe Food Allergy Institute ([ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT03349047) registration: NCT03349047). Enrollment criteria included patients aged 9 to 17.5 years with peanut or tree nut allergy. Their parents were also enrolled. Enrollment required that the patient answered "yes" to the question "Are you worried or troubled by the thought of being near or touching peanut or tree nuts?" The study was approved by the

Icahn School of Medicine at Mount Sinai's Institutional Review Board and involved written parental consent and child assent.

The primary outcome was the difference in patient-reported worry about casual exposure on a 10-point Likert scale anchored from 1 (=Not at all worried) to 10 (=Extremely worried) pre-post the study interaction in the intervention group compared with the control group. Prespecified secondary and exploratory outcomes were also evaluated and presented here. The description of the secondary and exploratory outcomes, power calculations, and additional statistical methods and the questionnaires used are available in this article's [Methods](#) and [Results](#) sections in the Online Repository at www.jaci-inpractice.org, and the full questionnaires are available in this article's Online Repository at www.jaci-inpractice.org.

After consent, but before randomization, patients and parents were asked to complete self-report questionnaires and then half the sample ($n = 30$) was randomized to the intervention (touching their allergen and education) and the other half ($n = 30$) was randomized to the control condition (education alone). Randomization was achieved with a random number generator and placement of the allocation group into individual envelopes by an investigator independent from the one pulling each envelope. Immediately after the study procedures, participants in both groups answered another set of questionnaires assessing their worry regarding casual exposure. One month after the visit, participants and their parents were sent a follow-up questionnaire packet electronically that was identical to that completed on the day of enrollment. Patients who did not send the packet back were emailed weekly for 2 months to remind them to complete it.

Patients in the control group were given education by one of the investigators who is also a physician in the clinic (T.W.) about being in proximity of and having contact with peanut and/or tree nuts. Education was scripted as follows: "Severe reactions happen from eating the allergic food. Being near a food or touching it is not likely to cause any reaction. If it did cause a reaction it would be a local itch or redness at the area touched, but even this is uncommon. You should be able to wash the area and not have any problem. In studies where peanut butter was put on the skin of children who were allergic, most had no symptoms and those who did only had rash or itch where the peanut touched them. No patient had a worse reaction. Another study had peanut-allergic children sniff peanut butter for 10 minutes and no one had a reaction from this." Patients in the intervention received the same education by the same investigator (T.W.), and both groups were allowed to ask questions regarding casual exposure. The intervention group participant was asked to hold a cup with a nut kernel in it and instructed to touch the nut with their finger. The maximum time allotted for each step was 5 minutes, and verbal encouragement by the family/investigator was allowed but no coercion. After the intervention the patients washed their hands. The physician who gave the education was present during the entirety of the intervention.

One hundred forty-nine eligible patients were identified and approached ([Figure 1](#)). Seventy-three patients responded "no" to the screening question. Seventy-six patients endorsed worry; 13 patients declined to consent because they were too worried about

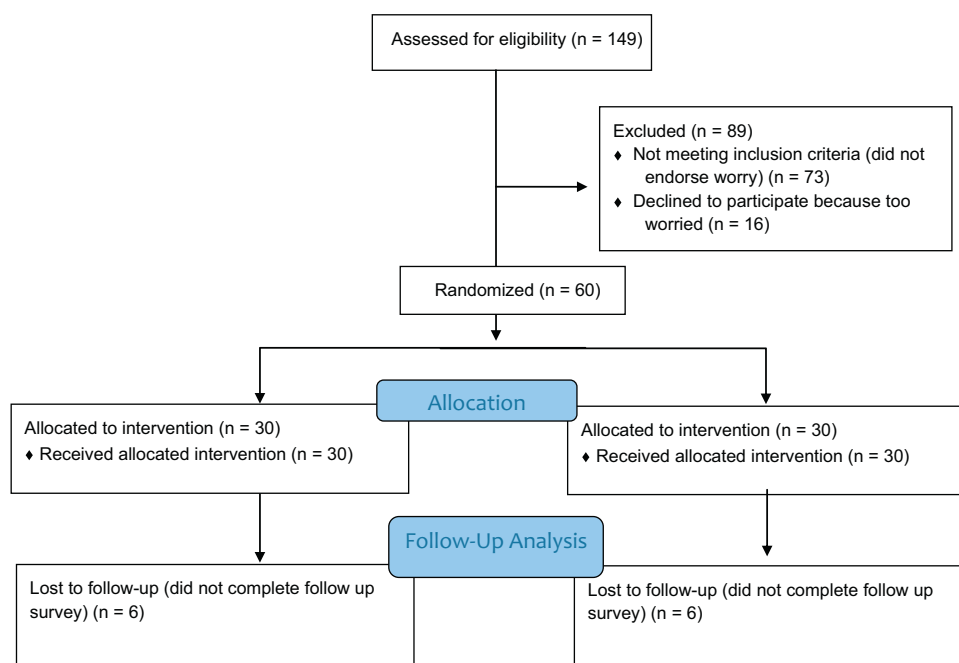


FIGURE 1. Enrollment flow diagram.

the intervention and 3 patients declined because the parent was too worried to participate. All patients completed the study in the group to which they were assigned. Forty-eight patients completed the follow-up questionnaires, 24 from each condition.

The mean age of the patients was 12.5 years and 55% were male (for additional demographic and clinical characteristics, see Table E1 in this article's Online Repository at www.jaci-inpractice.org). Regarding allergic reactions, 94.8% reported previous reactions, 48.3% with severe symptoms affecting breathing or circulation and 38% with epinephrine use, and 35.6% reported reactions from casual exposure.

For the primary outcome, average patient worry score in the intervention group (received education and touched the allergen) decreased from a baseline of 5.90 ± 2.23 to 3.27 ± 2.03 and the average patient scores in the control group (received education alone) decreased from a baseline of 5.98 ± 2.56 to 4.15 ± 2.83 immediately after the study (Table I). There was no statistically significantly greater decrease in worry about casual exposure pre- to immediately postintervention between the intervention group and the control group, which was the primary outcome ($P = .12$, partial eta squared = .04). All patients from both conditions reported decreased worry about casual exposure from before to immediately after the study intervention, and this result was statistically significant for all surveyed questions ($P < .001$).

Parents within both the intervention and control groups also reported decrease in worry for all surveyed questions (Table I; $P < .001$). Parent average reported scores on worry about casual exposure decreased from 6.23 ± 2.58 to 3.87 ± 2.40 in the intervention group and 6.73 ± 2.48 to 3.07 ± 2.20 in the control group immediately after the study. Similar to the patients, the intervention was not statistically different from the control. The only difference noted was that parents in the control group, when compared with those in the intervention group, had a greater decrease

in score when reporting worry about their child being near or touching the nut ($P = .03$; partial eta squared = .08).

When examining parent- and patient-reported worry about casual exposure from before to 1 month after the visit, a similar pattern was observed and all had a statistically significant decrease in worry within groups irrespective of condition, but the intervention was not statistically different to control (see Table E2 in this article's Online Repository at www.jaci-inpractice.org). Parents in both the intervention and control groups had improvement in quality-of-life measures 1 month after the visit ($P = .03$ and $.01$, respectively), but there was no statistical difference between groups ($P = .76$, partial eta squared = .00; see Table E3 in this article's Online Repository at www.jaci-inpractice.org). There was a statistically significant difference in parent-reported anxiety scale measures between the conditions ($P = .01$; partial eta squared = .14), with the control group showing a significant improvement in anxiety scores whereas the intervention group showed no difference. There was no statistically significant difference in patient-reported anxiety scores between or within groups from before and 1 month after the visit. There was a high satisfaction rate with participating (see Methods and Additional Results sections in this article's Online Repository at www.jaci-inpractice.org).

In summary, we found that both education and education with a behavioral intervention of allergen touch resulted in a statistically significant decrease in both patient- and parent-reported worry in both study arms and parents in both arms had improvement in quality-of-life scores 1 month after the visit. In addition, no patient in the intervention group dropped out or had an adverse outcome. The primary objective of the study was to compare education alone with education plus touching regarding the outcome of child-reported worry and we did not find a statistically significant difference. However, in powering the study we had not anticipated such a strong improvement among those receiving education alone

Outcome	Intervention			Control		
	Preintervention, mean ± SD	Postintervention, mean ± SD	<i>P</i> value within groups	Preintervention, mean ± SD	Postintervention, mean ± SD	<i>P</i> value within groups
Primary outcome: Child report of worry about being near or touching the allergen	5.90 ± 2.23	3.27 ± 2.03	<.001	5.98 ± 2.56	4.15 ± 2.83	<.001
Child report of worry about being around someone eating the allergen	5.27 ± 2.35	3.40 ± 2.01	<.001	5.05 ± 2.70	3.70 ± 2.78	<.001
Child report of worry about someone touching them after they have eaten the allergen	7.13 ± 2.21	4.20 ± 2.44	<.001	6.50 ± 2.46	4.40 ± 2.86	<.001
Parent report of worry about their child being near or touching the allergen	6.23 ± 2.58	3.87 ± 2.40	<.001	6.73 ± 2.48	3.07 ± 2.20	<.001
Parent report of worry about thought of your child being around someone eating the allergen	6.40 ± 2.84	3.73 ± 2.32	<.001	6.30 ± 2.72	2.87 ± 2.27	<.001
Parent report of worry about someone touching their child after eating the allergen	7.47 ± 2.57	4.30 ± 2.56	<.001	7.20 ± 2.43	3.13 ± 2.43	<.001
Parent report of perception of child's worry about being near or touching the allergen	7.37 ± 1.77	4.47 ± 2.53	<.001	7.30 ± 1.97	3.67 ± 2.47	<.001

In this study, it was demonstrated that worry about casual exposure is common in patients with peanut and tree nut allergy, as well as their families, and simple education about the risks of casual exposure given at routine office visits can significantly decrease worry and have improvements in quality of life in this population, which were sustained 1 month after the visit. The education given can be delivered in less than 2 minutes at routine visits, which offers strong translational capacities. Furthermore, the impact was robust for patients and their parents across a range of measures assessing worry about casual exposure and quality of life. The additional behavioral modality of having the participant touch the allergen may add to the effect, or add to the effect in selected patients, but a larger study is needed to address this possibility.

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ONLINE REPOSITORY

METHODS

Power and statistics

The study was powered to conduct a repeated-measures (pre-post) factorial ANOVA with 2 groups and a minimum of 0.8 power to detect medium size differences defined as partial eta squared = .25. For this analysis, it was determined that the study would require 34 unique tests (pre-post information on 17 subjects per group) using Cohen's definitions operationalized with G*Power software.^{E1} Based on the possibility of attrition and possible difficulty obtaining follow-up measures outside of clinic visits, it was determined that a final recruitment goal of $n = 30$ in each group would provide a sufficient number of subjects to detect a small-to-medium effect size for both the primary and secondary analyses of the primary outcome.

Descriptive statistics are reported for sociodemographic characteristics and allergy characteristics; all P values are 2-tailed. To compare baseline sociodemographic and allergy characteristics across groups, independent samples t tests and chi-square tests (for categorical variables) were used. Repeated-measures factorial ANOVAs were used to compare outcome measures from pre-intervention to postintervention between the conditions. All statistical analyses were run using the statistical software package SPSS Statistics version 24 (IBM Corporation, Armonk, NY). A P value of less than .05 was considered significant.

Secondary outcomes evaluated the difference in patient-reported and parent-reported worry before and after the intervention as well as 1 month afterward between and within the control and intervention groups. Exploratory outcomes also included patient- or parent-reported anxiety and quality of life before the study and at 1-month follow-up.

The following instruments, in addition to the Likert scales for worry related to casual exposure that were modeled on a previous study,^{E2} were used in this study (complete copies of the questionnaires are found online as well).

Demographic and allergy characteristics

Family demographic characteristics, information on severity of previous allergic reactions, and whether the child experienced a previous reaction due to casual exposure were recorded.

Screen for Child Anxiety-Related Emotional Disorders (parent version)

This is a 17-item questionnaire, designed for parents, that is used to assess symptoms of separation anxiety and generalized anxiety and in children aged 8 to 18 years. It is revised from the original Screen for Child Anxiety-Related Emotional Disorders, and it is a reliable and valid screening tool for clinically referred or primary care populations.^{E3,E4} Items are scored on a 3-point Likert scale ranging from 0 (not true or hardly ever true) to 2 (very or often true).

Screen for Child Anxiety-Related Emotional Disorders (child version)

This is a 17-item questionnaire, designed for the patient, which is used to assess symptoms of generalized anxiety and separation anxiety in children age 8 to 18 years. Validity was established in pediatric populations.^{E5,E6} The Likert scoring is as above.

Food Allergy Quality of Life-Parental Burden^{E7}

This food quality-of-life measure has been validated on parents of children with food allergy.

Acceptability and feasibility questionnaire—parent and child versions

One questionnaire asks the parent whether participating in the study was beneficial to both parent and child, and the other questionnaire asks the patient whether participating in the study was beneficial to them.

RESULTS

Acceptability

In regard to study acceptability, 97% of patients and parents in the intervention group and 89% of parents and 93% of patients in the control group reported that the session was beneficial. Ninety-three percent of parents and 83% of patients in the intervention group found that the session improved their understanding about the topic compared with 86% of parents and 93% of patients in the control group. On a scale of 1 to 10, where 1 is "not helpful" and 10 is "extremely helpful," parents in the intervention group had a mean score of 8.17 ± 2.17 and patients had a mean score of 7.45 ± 2.35 . In the control group, parents' mean score was 8.37 ± 1.99 and patients' mean score was 7.6 ± 1.79 .

Parent Survey_ Pre-Intervention

ID#: ____

I am the child's a. ☐ Mother b. ☐ Father c. ☐ Other _____**Your worry about child with being near the food (peanut/tree nut)**

On a scale of 1-10, where 1= NOT AT ALL WORRIED and 10= EXTREMELY WORRIED:

1. How worried are **you** by the thought of your child **being near or touching** the food (peanut or tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
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2. How troubled are **you** by the thought of your child **being around someone eating** the food (peanut, tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
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3. How worried are **you** by the thought of **someone touching your child after they have been eating** the food (peanut/tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
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Your impression about your child's worry4. How worried do you think **your child** is by the thought of **being near or touching** the food (peanut or tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
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FIGURE E1. Questionnaire packet.

Quality of Life Survey: FAOL-PB questionnaire

ID#: _____

Please use the following choices to enter a response in the table below:

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?

0-not limited	1-hardly limited at all	2-somewhat limited	3-moderately limited	4-quite a bit limited	5- very limited	6-extremely limited
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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?

0-not limited	1-hardly limited at all	2-somewhat limited	3-moderately limited	4-quite a bit limited	5- very limited	6-extremely limited
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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?

0-not limited	1-hardly limited at all	2-somewhat limited	3-moderately limited	4-quite a bit limited	5- very limited	6-extremely limited
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4. In the past week, 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?

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
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5. In the past week, 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?

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
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6. In the past week, how troubled have you been by anxiety related to your child's food allergy?

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
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7. In the past week, how troubled have you been that you child may not overcome their food allergy?

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
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FIGURE E1. (CONTINUED).

8. In the past week, how troubled have you been by the possibility of, or actually leaving your child in the care of others because of their food allergy?

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
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9. In the past week, how troubled have you been by frustration over others lack of appreciation for the seriousness of food allergy?

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
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10. In the past week, how troubled have you been by sadness regarding the burden your child carries because of their food allergy?

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
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11. In the past week, how troubled have you been about your child's attending school, camp, daycare or other group activity with children because of their food allergy?

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
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12. In the past week, how troubled have you been by your concerns for your child's health because of their food allergy?

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
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13. In the past week, how troubled with the worry that you will not be able to help your child if they have an allergic reaction to food?

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
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14. In the past week, how troubled have you been with the worry that your child will not have a normal upbringing because of their food allergy?

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
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15. In the past week, how troubled have you been about concerns for your child's nutrition because of their food allergy?

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
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16. In the past week, how troubled have you been with issues concerning your child being near others while eating because of their food allergy?

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
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17. In the past week, how troubled have you been with being frightened by the thought that your child will have a food allergic reaction?

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
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FIGURE E1. (CONTINUED).

Parent survey- SCARED	0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True
1) My child gets scared if he/she sleeps away from home.			
2) My child worries about other people liking him/her.			
3) My child is nervous.			
4) My child follows me wherever I go.			
5) My child worries about sleeping alone.			
6) My child worries about being as good as other kids.			
7) My child has nightmares about something bad happening to his/her parents.			
8) My child has nightmares about something bad happening to him/her.			
9) My child worries about things working out for him/her.			
10) My child is a worrier.			
11) My child is afraid to be alone in the house.			
12) People tell me that my child worries too much.			
13) My child doesn't like to be away from his/her family.			
14) My child worries that something bad might happen to his/her parents.			
15) My child worries about what is going to happen in the future.			
16) My child worries about how well he/she does things.			
17) My child worries about things that have already happened.			

FIGURE E1. (CONTINUED).

Parent Survey: Demographic Information and Allergy Characteristics ID#: _____

1. **I am the child's** a. ☐ mother b. ☐ father c. ☐ OTHER _____
2. **The age of the child is:** (years) _____ (months) _____
3. **The gender of the child is:** a. ☐ Male b. ☐ Female
4. **The ethnic origin of the child is:** a. ☐ Hispanic b. ☐ Non-Hispanic
5. **The race of the child is (check ALL that apply):**
 a. ☐ American Indian/Alaskan native b. ☐ Asian c. ☐ White/Caucasian
 d. ☐ Native Hawaiian/Pacific Islander e. ☐ African-American f. ☐ Prefer not to answer
6. **The child is allergic to the following foods (check ALL that apply):**
 a. ☐ Milk b. ☐ Egg c. ☐ Peanut d. ☐ Tree Nut e. ☐ Wheat
 f. ☐ Soy g. ☐ Fin Fish h. ☐ Shellfish i. ☐ Other (please specify): _____
7. **Has the child ever had an allergic reaction to a food? (Please do not consider a positive skin test alone, without a reaction to the food, to be an allergic reaction.) If NO, Proceed to Q9.**
 a. ☐ Yes b. ☐ No c. ☐ Unsure
 - 7a. **Has the child ever had a reaction that included breathing trouble or reduced consciousness?**
 a. ☐ Yes b. ☐ No c. ☐ Unsure
 - 7b. **Has the child ever received epinephrine for an allergic reaction?**
 a. ☐ Yes b. ☐ No c. ☐ Unsure
 - 7c. **Has your child ever had an allergic reaction from being near or touching the food (peanut/treenut)?**
 a. ☐ Yes b. ☐ No c. ☐ Unsure
8. **What is your annual household income?**
 a. ☐ Less than \$25,000 per year b. ☐ \$25K to \$50K c. ☐ \$50K to \$75K
 d. ☐ \$75K to \$100K e. ☐ \$100K to \$150K f. ☐ More than \$150,000/year
 g. ☐ I prefer not to specify
9. **What is the highest level of schooling you have completed?**
 a. ☐ High School b. ☐ Some college c. ☐ 2-yr college degree, or technical school
 d. ☐ 4-yr college degree e. ☐ Graduate degree f. ☐ Other (specify): _____
10. **Does your child carry a cellphone? Yes no sometimes usually**
 a. ☐ Yes b. ☐ No c. ☐ Sometimes d. ☐ Usually
11. **Does your child carry their own epinephrine autoinjector yes no sometimes usually**
 a. ☐ Yes b. ☐ No c. ☐ Sometimes d. ☐ Usually

FIGURE E1. (CONTINUED).

Patient Survey_Pre-Intervention

ID# : ____

Please select your gender (circle one): MALE FEMALE

On a scale of 1-10, where 1= NOT AT ALL WORRIED and 10= EXTREMELY WORRIED:

1. How worried are you by the thought of being near or touching the food (peanut, tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
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2. How worried are you by the thought of being around someone eating the food (peanut/tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
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3. How worried are you by the thought of someone touching you after they have eaten the food (peanut/tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
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FIGURE E1. (CONTINUED).

The SCARED- patient survey			
Below is a list of sentences that describe how people feel. Read each phrase and decide if it is "Not True or Hardly Ever True" or "Somewhat True or Sometimes True" or "Very True" or "Often True" for you. Then for each sentence, check the column that corresponds to the response that seems to describe you for the last 3 months.			
	0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True
1) I get scared if I sleep away from home.			
2) I worry about other people liking me.			
3) I am nervous.			
4) I follow my mother or father wherever they go.			
5) I worry about sleeping alone.			
6) I worry about being as good as other kids.			
7) I have nightmares about something bad happening to my parents.			
8) I have nightmares about something bad happening to me.			
9) I worry about things working out for me.			
10) I am a worrier.			
11) I am afraid to be alone in the house.			
12) People tell me that I worry too much.			
13) I don't like to be away from my family.			
14) I worry that something bad might happen to my parents.			
15) I worry about what is going to happen in the future.			
16) I worry about how well I do things.			
17) I worry about things that have already happened.			

FIGURE E1. (CONTINUED).

Patient Survey_Post-Intervention

ID# : ____

Please select your gender (circle one): MALE FEMALE

On a scale of 1-10, where 1= NOT AT ALL WORRIED and 10= EXTREMELY WORRIED:

1. How worried are you by the thought of being near or touching the food (peanut, tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
----------------------------	---	---	---	---	---	---	---	---	----------------------------

2. How worried are you by the thought of being around someone eating the food (peanut/tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
----------------------------	---	---	---	---	---	---	---	---	----------------------------

3. How worried are you by the thought of someone touching you after they have eaten the food (peanut/tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
----------------------------	---	---	---	---	---	---	---	---	----------------------------

FIGURE E1. (CONTINUED).

ID#: ____

Acceptability and Feasibility**Patient Form**

1. Did you find the session helpful?
a. Yes b. No c. Unsure
2. Do you think this session has increased your understanding about the risks of being near or touching the food (peanut/tree nut)?
a. Yes b. No c. Unsure
3. On a scale of 1-10, where 1= NOT AT ALL HELPFUL and 10= EXTREMELY HELPFUL, how helpful was this this session for decreasing your worry about being near or touching the food (peanut/tree nut)?

Not at all helpful 1	2	3	4	5	6	7	8	9	Extremely helpful 10
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FIGURE E1. (CONTINUED).

Parent Survey_ Post-Intervention

ID#: ____

I am the child's a. ☐ Mother b. ☐ Father c. ☐ Other _____

Your worry about child with being near the food (peanut/tree nut)

On a scale of 1-10, where 1= NOT AT ALL WORRIED and 10= EXTREMELY WORRIED:

1. How worried are **you** by the thought of your child **being near or touching** the food (peanut or tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
----------------------------	---	---	---	---	---	---	---	---	----------------------------

2. How troubled are **you** by the thought of your child **being around someone eating** the food (peanut, tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
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3. How worried are **you** by the thought of **someone touching your child after they have been eating** the food (peanut/tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
----------------------------	---	---	---	---	---	---	---	---	----------------------------

Your impression about your child's worry

4. How worried do you think **your child** is by the thought of **being near or touching** the food (peanut or tree nut)?

Not at all worried 1	2	3	4	5	6	7	8	9	Extremely Worried 10
----------------------------	---	---	---	---	---	---	---	---	----------------------------

FIGURE E1. (CONTINUED).

ID#: ____

Acceptability and Feasibility**Parent Form**

1. Did your child complete the protocol regarding being in near or touching to peanut or tree nuts?
 - a. Yes b. No
2. Did you find this beneficial to you and your child?
 - a. Yes b. No c. Unsure
3. Do you think this session has improved your understanding regarding the risks of being near or touching the food [peanut/tree nut]?
 - a. Yes b. No c. Unsure
4. On a scale of 1-10, where 1= NOT AT ALL HELPFUL and 10= EXTREMELY HELPFUL:

A. How helpful was this session for decreasing your anxiety about your child being near or touching the food (peanut/tree nut)?

Not at all helpful 1	2	3	4	5	6	7	8	9	Extremely helpful 10
----------------------------	---	---	---	---	---	---	---	---	----------------------------

B. How helpful do you think this session was for decreasing your child's anxiety about being near or touching the food (peanut/tree nut)?

Not at all helpful 1	2	3	4	5	6	7	8	9	Extremely helpful 10
----------------------------	---	---	---	---	---	---	---	---	----------------------------

FIGURE E1. (CONTINUED).

TABLE E1. Demographic characteristics of the sample by condition

Characteristic	Intervention (n = 30)	Control (n = 30)	Total (N = 60)	P value
Caregiver				0.10
Mother	27 (90)	22 (73.3)	49 (81.7)	
Father	3 (10)	8 (26.7)	11 (18.3)	
Age (y), mean $\pm$ SD	12.1 $\pm$ 2.8	12.9 $\pm$ 2.5	12.5 $\pm$ 2.7	
Sex: male	19 (63.3)	14 (46.7)	33 (55)	0.19
Ethnicity, non-Hispanic	27 (90)	27 (90)	54 (90)	1.00
Race				
American Indian/Alaskan native	1 (3.3)	0 (0)	1 (1.7)	0.31
Asian	1 (3.3)	6 (20)	7 (11.7)	0.04*
White/Caucasian	21 (70)	24 (80)	45 (75)	0.37
Native Hawaiian/Pacific Islander	0 (0)	0 (0)	0 (0)	NA
Black	0 (0)	0 (0)	0 (0)	NA
Annual household income, >\$150K	19 (73.1)	23 (76.7)	42 (75)	0.66
Highest level of school completed				0.33
High school	1 (3.7)	0 (0)	1 (1.8)	
Some college	2 (7.4)	1 (3.3)	3 (5.3)	
2-y college degree	0 (0)	2 (6.7)	2 (3.5)	
4-y college degree	10 (37.0)	6 (20)	16 (28.1)	
Graduate degree	12 (44.4)	19 (63.3)	31 (54.4)	
No. of food allergies, mean $\pm$ SD	3.10 $\pm$ 2.27	3.13 $\pm$ 1.66	3.12 $\pm$ 1.91	0.58
History of allergic reactions	26 (89.7)	29 (96.7)	55 (94.8)	0.08
Previous reaction that led to difficulty breathing or reduced consciousness	13 (43.3)	16 (53.3)	29 (48.3)	0.31
Previous epinephrine use	11 (36.7)	12 (40)	23 (38.3)	0.59
Previous reaction from casual exposure	10 (33.3)	11 (37.9)	21 (35.6)	0.04*

NA, Not applicable/available.

Note. Values represent n (%) unless otherwise indicated. P values based on a Pearson χ^2 . Last 3 queries allowed yes/no/unsure replies. For previous reaction from casual exposure (being near/touching), the P value reflects disparity in those unsure: in the intervention group 1 unsure and in the control group 7 unsure (P = .04).

*P < .05 (2-tailed).

TABLE E2. Outcomes between the intervention and control groups from preintervention to 1 mo postintervention

Outcome	Intervention			Control			P value between groups
	Preintervention, mean $\pm$ SD	1 mo post, mean $\pm$ SD	P value within groups	Preintervention, mean $\pm$ SD	1 mo post, mean $\pm$ SD	P value within groups	
Primary outcome: Child report of worry about being near or touching the allergen	5.90 $\pm$ 2.23	3.18 $\pm$ 1.76	<0.001	5.98 $\pm$ 2.56	3.83 $\pm$ 2.71	<0.001	0.42
Child report of worry about being around someone eating the allergen	5.27 $\pm$ 2.35	3.77 $\pm$ 2.07	<0.001	5.05 $\pm$ 2.70	3.96 $\pm$ 2.98	<0.001	0.53
Child report of worry about someone touching them after they have eaten the allergen	7.13 $\pm$ 2.21	4.36 $\pm$ 1.92	<0.001	6.50 $\pm$ 2.46	4.22 $\pm$ 3.06	<0.001	0.44
Parent report of worry about their child being near or touching the allergen	6.23 $\pm$ 2.58	3.88 $\pm$ 1.87	<0.001	6.73 $\pm$ 2.48	4.71 $\pm$ 2.93	<0.001	0.92
Parent report of worry about thought of your child being around someone eating the allergen	6.40 $\pm$ 2.84	4.17 $\pm$ 2.30	<0.001	6.30 $\pm$ 2.72	4.42 $\pm$ 2.84	<0.001	1.00
Parent report of worry about someone touching their child after eating the allergen	7.47 $\pm$ 2.57	4.63 $\pm$ 2.45	<0.001	7.20 $\pm$ 2.43	4.54 $\pm$ 3.08	<0.001	0.92
Parent report of perception of child's worry about being near or touching the allergen	7.37 $\pm$ 1.77	5.29 $\pm$ 1.88	<0.001	7.30 $\pm$ 1.97	5.38 $\pm$ 3.19	<0.001	0.76

Note. Results presented as means.

TABLE E3. Comparison of QOL and SCARED surveys between and within groups from baseline and 1 mo after the visit

Questionnaire	Intervention			Control			
	Baseline	1-mo follow-up	<i>P</i> value within group*	Baseline	1-mo follow-up	<i>P</i> value within group	<i>P</i> value between groups
QOL	33.79 ± 18.21	27.96 ± 18.33	.03	37.30 ± 21.02	30.38 ± 19.73	.01	.76
Parent SCARED	6.05 ± 5.95	7.41 ± 7.46	.13	9.10 ± 7.52	7.00 ± 5.67	.04	.01
Patient SCARED	9.75 ± 7.49	8.05 ± 7.13	.11	9.29 ± 2.95	8.70 ± 7.58	.56	.45

QOL, Quality of life; SCARED, Screen for Child Anxiety-Related Emotional Disorders.

**P* < .05 (2-tailed).

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