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# Food allergy in adolescents: validation of the food allergy independent measure and the EuroPrevall food allergy quality of life questionnaire into Spanish

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### KEYWORDS

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### Abstract

**Background:** Different questionnaires have been developed globally to assess and compare the impact of food allergy on the quality of life. The aim of this study was to validate a Spanish translation of the Food Allergy Independent Measure (FAIM) and the EuroPrevall Food Allergy-Quality of Life Questionnaire-Teenage Form (FAQLQ-TF) for adolescents aged 13-17 years.

**Methods:** Sixty adolescents diagnosed with immunoglobulin E-mediated allergy to food completed the questionnaires. Cronbach's alpha was used to assess internal consistency; correlation between FAQLQ-TF and FAIM was used to test construct validity. The discriminant validity was evaluated by comparison with the number of offending foods, the perceived impact on social life, the diagnosis of anaphylaxis, and the previous prescription of adrenaline auto-injectors (AAI).

**Results:** No question fulfilled criteria to be removed from the questionnaire. For FAIM, Cronbach's alpha = 0.763, and for the four domains of FAQLQ-TF, Cronbach's alpha = 0.797-0.847. A significant correlation existed between FAQLQ-TF and FAIM, and of both of them with anaphylaxis and the prescription of AAI ( $P < 0.05$  for all comparisons).

**Conclusions:** This Spanish translation of FAIM and FAQLQ-TF for adolescents had good internal consistency and construct validity as well as ability to discriminate patients according to the number of foods to avoid, impact on social life, diagnosis of anaphylaxis, and AAI prescription.

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## Introduction

High prevalence of food allergy has become a global challenge.<sup>1</sup> Food allergy has a broad spectrum of severity, from minor sporadic symptoms to severe, life-threatening reactions. Thus, its impact on the quality of life (QoL) is variable, and, in addition to clinical reactions, costs and limitations in everyday life pose further challenges for children and their families.

Education of patients, food challenge tests, and recent procedures, such as desensitization or induction of oral tolerance, can have a favorable impact on QoL,<sup>2,3</sup> although they are not always free of risks and can induce high direct and indirect costs.

The EuroPrevall initiative, with financial support from the Framework Programme FP6 of the European Union, had the objective of evaluating several aspects of food allergy in Europe, such as epidemiology, diagnosis, and treatment of food allergy.<sup>4</sup> It developed some questionnaires on food allergy to assess and compare QoL across countries with the same tools. Specific questionnaires were developed for children, adolescents, and parents,<sup>5-7</sup> which require to be translated and validated in different languages before use. The aim of our work was to validate into Spanish (Spain) the translation of the Food Allergy Independent Measure (FAIM) and the EuroPrevall Questionnaire on Food Allergy-Quality of Life Teenage Form (FAQLQ-TF) for adolescents aged 13-17 years.

## Material and Methods

The English version of both FAQLQ-TF and FAIM<sup>6</sup> were translated into Spanish following the same process as done before with the version of the questionnaires for children.<sup>8</sup> Briefly, one of the authors, fluent in English and having over 20 years of experience in the evaluation of children and adolescents with food allergy, made the first translation, which was reviewed by other authors, to agree upon the final version. This was back-translated into English by an independent professional bilingual translator. The back-translated version was checked with the original one, and no relevant differences were found; hence, the agreed version was used for the study. A large pilot group of adolescents completed the questionnaires and could understand and answer all the questions (results not included), so the questionnaires were then used for the patients of this study. The translated versions are shown in the online Supplementary Figure S1.

Consecutive adolescents, 13-17-year old, filled in the questionnaires. They had immunoglobulin E (IgE)-mediated food allergy, based on compatible clinical manifestations, on the ingestion of food, together with positive skin prick test and/or serum-specific IgE. During one visit scheduled for a food challenge, before a reaction could occur, the adolescents filled in the questionnaire. For avoiding selection bias, they were invited to participate independent of severity of allergy or the number of offending foods.

The FAQLQ-TF had 23 questions in the following four domains: six questions on allergen avoidance, six on risk of accidental exposure, seven on emotional impact, and four on dietary restrictions.

The FAIM, used to evaluate the construct validity of questionnaires, has been shown to be relevant, reliable, and have face validity to independently measure food allergy.<sup>9</sup> It includes four questions on expectation of outcome (EO), the perception of potential reactions after exposure to offending foods, and two questions on independent measures (IM), number of offending foods to avoid, and impact on social activities. The electronic records were reviewed to collect information about the diagnosis of anaphylaxis and the prescription of adrenaline auto-injectors (AAI). The study was approved by the Ethics Committee of the Health Research Institute La Fe (No. 2020-003-1), and results were coded to guarantee anonymity of responders.

The answers to the questions follow a Likert scale, ranging from 0 to 6, with higher values associated to worse QoL. The consistency of FAQLQ-TF domains and FAIM was assessed with Cronbach's alpha. The corrected item-total correlations and changes in Cronbach's alpha if an item was deleted were also estimated. The Spearman's correlation value between the questions of FAQLQ-TF and those of FAIM was calculated. The Mann-Whitney U test was used to compare the values of FAQLQ-TF domains and FAIM depending on the diagnosis of anaphylaxis and previous prescription of AAI. SPSS 15.0, 2006 program (Chicago, Ill, USA) was used for calculations.

## Results

Sixty adolescents completed the questionnaires. Their demographic and clinical data are shown in Table 1. They answered all the questions with no blank responses.

Table 2 shows the values of Cronbach's alpha (all values >0.7) for FAIM, FAQLQ-TF, and its four domains. Additional measures for each question of FAIM are also shown therein. Specific values for FAQLQ-TF domains are shown in Supplementary Tables S1-S4. If the corrected item-total correlation is less than 0.3, or if there is a

**Table 1** Demographic and clinical description of participants; numbers (percentage).

Gender	Male	35 (58.3)	Age (mean and range)	14.7
	Female	25 (41.7)		(13.0-17.2)
Age	<15 years	36 (60)	Monoallergic	17 (28.3)
	>15 years	24 (40)		43 (71.7)
Asthma	No	35 (58.3)	Foods	n
	Yes	25 (41.7)		3
Anaphylaxis	Yes	27 (45.0)	Egg	11
	No	33 (55.0)		32
Adrenaline	Yes	26 (43.3)	Walnut	23
	No	34 (56.7)		20
Number of offending foods	1	17 (28.3)	Peanut	9
	2	13 (21.7)		11
	3	7 (11.7)		19
	4	3 (5.0)		25
	5	8 (13.3)		9
	6	3 (5.0)		14
	>6	9 (15.0)		52

**Table 2** Values of Cronbach's alpha for the whole Food Allergy Quality of Life Questionnaire-Teenage Form (FAQLQ-TF) and its four domains, and the whole Food Allergy Independent Measure (FAIM) and its questions (EO1-EO4, IM1, and IM2).

	No. of questions	Cronbach's alpha	Cronbach's alpha if an item was deleted (range)	Corrected item/total correlation (range)
Whole FAQLQ-TF	23	0.937	0.931-0.937	0.443-0.779
Allergen avoidance	6	0.847	0.805-0.845	0.526-0.732
Risk of accidental exposure	6	0.802	0.720-0.796	0.441-0.763
Emotional impact	7	0.804	0.756-0.800	0.415-0.690
Dietary restrictions	4	0.797	0.702-0.840	0.449-0.706
FAIM	6	0.763	0.697-0.778	0.285-0.611
EO1: Chance of accidental exposure	-	-	0.778	0.285
EO2: Chance of severe reaction	-	-	0.715	0.551
EO3: Chance of dying	-	-	0.697	0.611
EO4: Chance of not acting effectively	-	-	0.739	0.459
IM1: Number of foods to avoid	-	-	0.713	0.580
IM2: Effect on social life	-	-	0.713	0.562

substantial increase in the Cronbach's alpha if an item is deleted, the removal of that question is generally recommended.<sup>10</sup> This first criterion for removal was observed with FAIM question EO1 ("Chance that you will accidentally eat something to which you are allergic") that had an item-total correlation value of 0.286. The second criterion had no specific cut-off point, but if question 10 of FAQLQ-TF ("How troublesome do you find it, because of your food allergy, that you must refuse treats at school or work?") was deleted, then there would be an increase in Cronbach's alpha from 0.797 to 0.840. None of the rest of the questions met those criteria.

Significant correlations were observed between the whole FAQLQ-TF and its domains and the whole FAIM and its six questions ( $P < 0.05$ ). Further, significant correlations were also discovered when evaluating individual questions of FAQLQ-TF with those of FAIM (Table 3).

The diagnosis of anaphylaxis and the fact of having been prescribed AAI (Table 4 and Supplementary Table S5) were associated with worse values of the whole FAQLQ-TF and its domains and whole FAIM and its six questions, except for having nearly significant association ( $P = 0.06$ ) between the prescription of AAI and FAIM question EO4 ("Chance that you cannot effectively deal with an accidental allergic reaction"). Allergy to elemental foods, such as milk and eggs, had significantly worse QoL, and polyallergic patients had worse FAIM values than monoallergic patients (Table 4 and Supplementary Table S6); patient's age or the presence of asthma was not significant (Table 4). A correlation was observed ( $P < 0.001$ ) between the values of FAQLQ-TF and its domains and the number of foods that patients felt they had to avoid (Supplementary Table S7). The time elapsed since the last reaction was not significant ( $P > 0.26$  for all questions).

There was no floor or ceiling effect: none of the patients had the lowest score in the whole FAQLQ-TF and its domains and FAIM and its questions. Only one patient (1.7%) had the highest score for the domain of allergen avoidance, and another patient in FAIM well below the acceptable proportion of 15%.<sup>11</sup>

## Discussion

Validation of common questionnaires in different languages is important to compare food allergy across the world. Versions of questionnaires for children aged 8-12 years and for parents have been already validated in Spanish and other languages.<sup>8,12,13</sup> Nevertheless, validation of FAQLQ-TF or other questionnaires<sup>14</sup> for adolescents was practically nonexistent in languages other than English, even though adolescents have frequent reactions,<sup>15</sup> which impact their QoL. In this study, we aimed to validate FAQLQ-TF and FAIM for adolescents in Spanish.

Values of Cronbach's alpha for the whole FAQLQ-TF and its four domains were more than 0.79 (values above 0.70 are considered acceptable).<sup>16</sup> Likewise, Cronbach's alpha for FAIM was 0.763. These results demonstrated a good global internal consistency.

Nevertheless, if the question on accepting treats at school or work place was deleted, then Cronbach's alpha for the domain of dietary restrictions showed a moderate increase from 0.797 to 0.840. The fact that our study was conducted during the COVID-19 pandemic must have affected this domain, as sharing treats at school or work place was prohibited since the beginning of the outbreak; although, this limitation on treats is probably not as important in adolescents as in younger children. One of the FAIM questions (EO1: "Chance of accidental reaction") showed a corrected item-total correlation of 0.285, intending a low correlation of this question with the summated scores of other questions in FAIM. If the values are less than 0.3 or even 0.4,<sup>10</sup> then the removal of the question should be considered, as it may not be measuring the same entity as the others.

The correlation of FAQLQ-TF with independent FAIM was assessed to evaluate the construct validity of the questionnaire.<sup>9</sup> We discovered significant correlations between the global scores and the scores of FAQLQ-TF domains. Most, but not all, of the correlations between individual questions of FAQLQ-TF and FAIM questions were significant. While FAIM mostly reflects the severity of food allergy, some of the questions in FAQLQ-TF reflect impact

**Table 3** Correlation (Spearman's coefficient) of the Food Allergy Quality of Life Questionnaire-Teenage Form (FAQLQ-TF) score and its domains with the Food Allergy Independent Measure (FAIM) score and its questions.

FAQLQ-TF	FAIM						
	Total	EO1	EO2	EO3	EO4	IM1	IM2
Total	0.734***	0.475***	0.502***	0.489***	0.417**	0.674***	0.601***
<b>Allergen avoidance</b>	0.67***	0.61***	0.40**	0.33*	0.43**	0.61***	0.52***
4 Read labels	0.42**	0.36**	0.34**	0.21	0.39**	0.22	0.35**
6 Stay for a meal	0.63***	0.55***	0.38**	0.31*	0.37**	0.60***	0.54***
7 Try fewer	0.26*	0.01	0.08	0.07	0.16	0.36**	0.38**
8 Check yourself	0.56***	0.32*	0.35**	0.38**	0.47***	0.45***	0.39**
9 Hesitate eating	0.53***	0.63***	0.39**	0.20	0.31*	0.39**	0.30*
16 Explain people	0.26*	0.40**	0.03	-0.06	0.15	0.33*	0.27*
<b>Risk of accidental exposure</b>	0.68***	0.45***	0.48***	0.45***	0.34**	0.61***	0.54***
11 Touching foods	0.45***	0.14	0.28*	0.35**	0.37**	0.34**	0.48***
13 Ingredients change	0.64***	0.34**	0.40**	0.45***	0.27*	0.65***	0.60***
14 Label traces of	0.49***	0.42**	0.42**	0.31*	0.16	0.40**	0.29*
15 Label different	0.34**	0.23	0.37**	0.24	0.16	0.31*	0.29*
17 Others can eat	0.41**	0.33**	0.13	0.20	0.20	0.44***	0.34**
18 Not take account	0.46***	0.42**	0.40**	0.30*	0.25	0.34**	0.29*
<b>Emotional impact</b>	0.68***	0.30*	0.61***	0.56***	0.38**	0.56***	0.48***
5 Less control	0.61***	0.41**	0.46***	0.42**	0.28*	0.59***	0.43**
12 Carry adrenaline	0.43**	0.16	0.33*	0.44***	0.07	0.49***	0.33**
19 Allergic reaction	0.50***	0.12	0.62***	0.42**	0.39**	0.24*	0.22
20 Eating wrong	0.60***	0.26*	0.63***	0.48***	0.39**	0.27*	0.32*
21 Never before	0.49***	0.31*	0.40**	0.36**	0.33*	0.48***	0.34**
22 Discouraging reaction	0.36**	0.26*	0.17	0.23	0.26*	0.30*	0.35**
23 Not taking account	0.33**	0.01	0.37**	0.34**	0.20	0.23	0.33**
<b>Dietary restriction</b>	0.65***	0.35**	0.32*	0.51***	0.36**	0.65***	0.64***
1 Always watching	0.58***	0.35**	0.41**	0.44***	0.27*	0.46***	0.49***
2 Eating fewer things	0.57***	0.14	0.27*	0.45**	0.35**	0.62***	0.64***
3 Limited in buying	0.60***	0.27*	0.33*	0.47***	0.51***	0.52***	0.56***
10 Refuse treats	0.32**	0.34**	0.19	0.29*	0.08	0.45***	0.39**

Correlation is significant at \*0.05, \*\*0.01, and \*\*\*0.001 levels.

EO1: chance of accidental exposure; EO2: chance of severe reaction if exposed accidentally; EO3: chance of dying if exposed accidentally; EO4: chance of not acting effectively if exposed accidentally; IM1: number of foods one needs to avoid; IM2: effect of food allergy on social life.

**Table 4** Mean rank values of the Food Allergy Quality of Life Questionnaire-Teenage Form (FAQLQ-TF) score and its domains, and Food Allergy Independent Measure (FAIM) score and its questions, according to the diagnosis of anaphylaxis and having been prescribed autoinjectable adrenaline.

		Whole FAQLQ-TF			FAIM		
		Mean rank	U	P	Mean rank	U	P
Anaphylaxis	No (n = 33)	21.62	152	<0.001	21.55	150	<0.001
	Yes (n = 27)	41.35			41.44		
Adrenaline	No (n = 34)	22.50	170	<0.001	22.21	160	<0.001
	Yes (n = 26)	40.96			41.35		
Age	<15 years (n = 36)	29.58	399	0.618	31.03	384	0.73
	≥15 years (n = 24)	31.88			29.71		
Asthma	No (n = 35)	27.59	336	0.126	28.53	369	0.300
	Yes (n = 25)	34.58			33.26		
Monoallergic vs. polyallergic	Monoallergic (n = 17)	24.68	266	0.104	22.50	229	0.025
	Polyallergic. (n = 43)	32.80			33.66		
Allergic to milk and/or eggs	No (n = 12)	28.78	182	0.049	28.44	219	0.201
	Yes (n = 48)	39.38			38.75		
Allergic to nuts	No (n = 20)	25.23	295	0.098	25.28	347	0.405
	Yes (n = 40)	33.14			33.11		



on everyday QoL, and there may be no correlations, as we also found, to a greater extent, in the questionnaires for children aged 8-12 years.<sup>8</sup>

The discriminant capacity was assessed through several variables. In the validation of both our version and the English version, adolescents who had to avoid more foods demonstrated worse scores in questionnaires.<sup>6</sup> We found worse scores for both FAQLQ-TF and FAIM in children with anaphylaxis or having previous prescription of adrenaline. In the validation of the English version, FAQLQ-TF was not able to discriminate between patients with and without anaphylaxis.<sup>6</sup> In our case, this association was clear for global scores as well as for all the questions of FAIM; however, it had not been so clear in the questionnaires for children aged 8-12 years,<sup>8</sup> may be because of less maturity to understand the consequences of food allergy. Allergy to basic foods, such as milk and eggs, was associated with worse QoL, and polyallergy was linked to worse FAIM; however, these variables did not indicate the same consistency as anaphylaxis or adrenaline prescription. In fact, their significance was mainly driven by only one or two individual questions, and not by all of them as for anaphylaxis or adrenaline prescription.

No ceilings or floor effects were found for questionnaires and domains.<sup>11</sup> This finding, together with the significant differences according to anaphylaxis, prescription of adrenaline and number of foods to avoid, support the discriminant ability of the Spanish version.

Some limitations of our study were common with validation in children aged 8-12 years.<sup>8</sup> We did not perform a comparison of FAQLQ-TF with generic health-related QoL questionnaires. Specific questionnaires are more adequate to evaluate changes in QoL because of food allergy,<sup>17,18</sup> and a low agreement has been described between specific and generic questionnaires,<sup>18,19</sup> which are recommended, instead, to compare different disorders.<sup>17,18</sup> The test-retest reliability was not evaluated either, as the food challenge performed on the day when questionnaires were completed could induce a relevant change in QoL. This potential change on the stability of patient's condition could invalidate results of the retest. However, excellent reliability has been established for the English version of FAQLQ-TF.<sup>6,20</sup>

## Conclusion

In summary, the Spanish version of both FAQLQ-TF and FAIM has shown good values regarding internal consistency, construct validity, and acceptable discriminant capacity for some clinical variables. Although it has some limitations and some questions require further evaluation, it can be used as a validated questionnaire for QoL in adolescents with food allergy similar to other language versions until better tools are designed.

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## Supplementary

## FAQoLQ-TF: Food Allergy Quality of Life Questionnaire - Formulario para adolescentes (13-17 años)

- Las siguientes preguntas se refieren a cuánta importancia tiene tu alergia a alimentos sobre tu calidad de vida.
- Por favor, responde cada pregunta marcando la casilla adecuada con una “x”. Las posibles respuestas se muestran en esta tabla →

**Opciones de respuesta**

0 = nada  
 1 = casi nada  
 2 = ligeramente  
 3 = regular  
 4 = bastante  
 5 = mucho  
 6 = muchísimo

Toda la información proporcionada es totalmente confidencial.

El cuestionario será identificado por un código numérico.

A causa de tu alergia a alimentos, ¿cuánto te molesta ...		0	1	2	3	4	5	6
1	tener que estar siempre vigilando lo que comes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	poder comer menos cosas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	estar limitado en las cosas que puedes comprar?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	tener que leer las etiquetas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	sentir que tienes menos control de la comida cuando comes fuera?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	estar limitado para aceptar espontáneamente una invitación para comer fuera?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	estar limitado para probar o comer distintas cosas fuera de casa?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	tener que comprobar tú mismo si puedes comer algo cuando comes fuera de casa?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	dudar si comer alguna cosa cuando no estás seguro de ella?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	tener que rechazar chucherías en el colegio o el trabajo?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	tener cuidado con tocar ciertos alimentos?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	tener que llevar adrenalina? (si no la llevas marca aquí <input type="checkbox"/> )	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Figure S1** Cuestionario de Calidad de Vida en Alergia Alimentaria—Formulario para adolescentes (13-17 años).

**Opciones de respuesta**

0 = nada  
 1 = casi nada  
 2 = ligeramente  
 3 = regular  
 4 = bastante  
 5 = mucho  
 6 = muchísimo

<b>A causa de tu alergia a alimentos, ¿cuánto te molesta ...</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
13 que cambien los ingredientes de un producto?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 que la etiqueta diga: “Puede contener trazas de ...”?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 que la etiqueta del paquete grande (por ejemplo, una bolsa o caja) sea diferente de la del paquete individual?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 tener que explicar a la gente que tienes alergia a algún alimento?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 que en las actividades sociales otros puedan comer el alimento al que le tienes alergia?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 que en las actividades sociales no se tenga en cuenta lo suficiente tu alergia a alimentos?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A causa de tu alergia a alimentos, ¿cuánto te asusta ...</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
19 tener una reacción alérgica?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 comer por error algo equivocado?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 comer algo que no has comido nunca antes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Por favor, responde las siguientes preguntas</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
22 ¿Cuánto te desanimas durante una reacción alérgica?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 ¿Cuánto te decepcionas si la gente no tiene en cuenta tu alergia a alimentos?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Figure S1** (Continued)



**FAIM: Food Allergy Independent Measure- Teenager form (13- 17 años)****Medida independiente de la alergia a alimentos - Versión adolescentes**

Las siguientes cuatro preguntas se refieren a lo que piensas de las probabilidades de que te pase algo a causa de tu alergia a alimentos. Escoge una de las respuestas. Luego hay dos preguntas más sobre tu alergia. Responde, por favor, cada pregunta marcando con una “x” en la respuesta adecuada

0	1	2	3	4	5	6
Ninguna (0% de probabilidad )	Muy poca probabilidad	Poca probabilidad	Probabilidad intermedia	Bastante probabilidad	Mucha probabilidad	Total (100% de probabilidad)

**¿En tu opinión, cuánta probabilidad hay de que ...**

	0	1	2	3	4	5	6
a. por error comas algo a lo que tienes alergia?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. tengas una reacción grave si por error comes algo a lo que tienes alergia?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. puedas morir si por error comes algo a lo que tienes alergia?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. <u>no</u> puedas tratar adecuadamente una reacción alérgica si por error comes algo a lo que tienes alergia?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. ¿Cuántos productos tienes que evitar a causa de tu alergia a alimentos?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Casi ninguno	Muy pocos	Pocos	Algunos	Muchos	Muchísimos	Casi todos	
f. ¿Qué impacto tiene tu alergia a alimentos sobre tu vida social?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insignificante	Muy pequeño	Pequeño	Moderado	Grande	Muy grande	Extremadamente grande	

**Figure S1** (Continued)

**Table S1** Modifications in Cronbach's alpha for each question in the domain of allergen avoidance (Cronbach's alpha = 0.847).

	Cronbach's alpha when an item was deleted	Corrected item/total correlation
4 Read labels	0.842	0.526
6 Stay for a meal	0.817	0.658
7 Try fewer	0.805	0.718
8 Check yourself	0.819	0.656
9 Hesitate eating	0.805	0.732
16 Explain people	0.845	0.527

**Table S2** Modifications in Cronbach's alpha for each question in the domain of risk of accidental exposure (Cronbach's alpha = 0.802).

	Cronbach's alpha when an item was deleted	Corrected item/total correlation
11 Touching foods	0.779	0.521
13 Ingredients change	0.720	0.763
14 Label traces of	0.770	0.565
15 Label different	0.766	0.580
17 Others can eat	0.796	0.441
18 Not take account	0.787	0.483

**Table S3** Modifications in Cronbach's alpha for each question in the domain of emotional impact (Cronbach's alpha = 0.804).

	Cronbach's alpha when an item was deleted	Corrected item/total correlation
5 Less control	0.776	0.550
12 Carry epipen	0.799	0.460
19 Allergic reaction	0.761	0.643
20 Eating wrong	0.756	0.690
21 Never before	0.756	0.666
22 Discouraged reaction	0.799	0.415
23 Not taking account	0.800	0.418

**Table S4** Modifications in Cronbach's alpha for each question in the domain of dietary restriction (Cronbach's alpha = 0.797).

	Cronbach's alpha when an item was deleted	Corrected item/total correlation
1 Always watching	0.710	0.682
2 Eating fewer things	0.731	0.644
3 Limited in buying	0.702	0.706
10 Refuse treats	0.840	0.449

**Table S5** Mean rank of values of the Food Allergy Quality of Life Questionnaire-Teenage Form (FAQLQ-TF) score and domains, and Food Allergy Independent Measure (FAIM) score and questions according to the diagnosis of anaphylaxis and the previous prescription of autoinjectable adrenaline.

	Anaphylaxis				Autoinjectable adrenaline			
	No (n = 33)	Yes (n = 27)	U	P	No (n = 34)	Yes (n = 26)	U	P
Whole FAQLQ-TF	21.62	41.35	152	<0.001	22.50	40.96	170	<0.001
Allergen avoidance	23.58	38.96	217	0.001	23.94	39.08	219	0.001
Risk of accidents	22.26	40.57	173	<0.001	23.24	40.00	195	<0.001
Emotional impact	21.48	41.52	148	<0.001	22.10	41.48	156	<0.001
Dietary restrictions	22.86	39.83	193	<0.001	23.91	39.12	218	0.001
FAIM	21.55	41.44	150	<0.001	22.21	41.35	160	<0.001

(Continues)

**Table S5** (Continued)

	Anaphylaxis				Autoinjectable adrenaline			
	No (n = 33)	Yes (n = 27)	U	P	No (n = 34)	Yes (n = 26)	U	P
EO1: Chance of accidental exposure	26.17	35.80	302	0.029	25.79	36.65	282	0.014
EO2: Chance of severe reaction	23.18	39.44	204	<0.001	24.00	39.00	221	0.001
EO3: Chance of dying	22.12	40.74	169	<0.001	22.96	40.37	185	<0.001
EO4: Chance of not acting effectively	26.11	35.87	300	0.028	26.87	35.25	318	0.060
IM1: Number of foods to avoid	23.91	38.56	228	0.001	23.69	39.40	210	<0.001
IM2: Effect on social life	24.29	38.09	240	0.002	24.71	38.08	245	0.002

**Table S6** Mean rank of values of the Food Allergy Quality of Life Questionnaire-Teenage Form (FAQLQ-TF) score and its domains, and Food Allergy Independent Measure (FAIM) score and its questions according to polyallergy and allergy to milk and eggs.

	Allergy to milk and/or eggs				Polyallergic			
	No (n = 48)	Yes (n = 12)	U	P	No (n = 34)	Yes (n = 26)	U	P
Whole FAQLQ-TF	28.28	39.38	182	0.049	26.48	32.80	267	0.104
Allergen avoidance	27.92	40.83	164	0.022	26.03	32.27	290	0.212
Risk of accidents	29.04	36.33	218	0.195	26.53	32.07	293	0.268
Emotional impact	28.74	37.54	203	0.118	25.79	32.36	286	0.189
Dietary restrictions	27.43	42.79	140	0.006	23.82	33.14	252	0.062
FAIM	28.44	38.75	189	0.067	22.50	33.66	230	0.025
EO1: Chance of accidental exposure	28.26	39.46	181	0.041	32.26	29.80	336	0.612
EO2: Chance of severe reaction	29.45	34.71	238	0.343	26.53	32.07	298	0.261
EO3: Chance of dying	29.04	36.33	218	0.186	24.85	32.73	270	0.108
EO4: Chance of not acting effectively	30.24	31.54	275	0.814	27.32	31.76	312	0.366
IM1: Number of foods to avoid	27.94	40.75	165	0.019	20.41	34.49	194	0.004
IM2: Effect on social life	27.38	43.00	138	0.004	18.71	35.16	165	0.001

**Table S7** Spearman's correlation of the values of FAQLQ-TF and its domains with the number of foods to avoid ( $P < 0.001$  in all cases).

	Whole FAQLQ-TF	Allergen avoidance	Risk of accidental exposure	Emotional impact	Dietary restriction
Number of foods to avoid	0.674	0.647	0.607	0.555	0.614