

Translation, adaptation and initial validation of *Food Allergy Quality of Life Questionnaire*: child form in Greek

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Abstract

The aim of the study is to determine the reliability and validity of the Greek version of the Food Allergy Quality of life Questionnaire-Child Form (FAQLQ-CF). After linguistic validation, the Greek FAQLQ-CF, Food Allergy Independent Measure (FAIM) and Pediatric Quality of Life Inventory (PedsQL™) were used by a physician to interview children diagnosed with food allergy and aged 8-12 via telephone. Cronbach's alpha was used to evaluate reliability, and factor analysis to assess construct validity. The correlation between FAQLQ-CF and FAIM was moderate ($\rho=0.509$, $P<0.001$) and internal consistency was strong (Cronbach's alpha 0.905). FAQLQ-CF discriminated well each question's contribution to children's quality of life deterioration (32-

80%), each child's quality of life (17-89%), children differing in doing things with others (total score 3.55 vs 2.57, difference = 0.98 > minimal clinical importance difference = 0.5; $P<0.001$), but not children differing in reporting anaphylaxis. The total FAQLQ-CF score correlated with the total PedsQL™ score and with the score of one of PedsQL™ subscales, demonstrating convergent validity. Factor analysis uncovered an underlying structure of four factors, explaining 50% of the variance. We can conclude that Greek FAQLQ-CF is a reliable, valid, discriminant tool for interviewing food allergic children aged 8-12, detecting those in need for immediate care.

Introduction

Food allergy in children may be a major global public health problem due to the increasing rate of prevalence (Rona *et al.*, 2007; Mills *et al.*, 2007; Gupta *et al.*, 2011). The upward trend has led the scientific community on an ongoing investigation into the causes, prevention, diagnosis and methods of treatment. The quality of life of children with food allergy disturbed but the exact impact is not adequately specified. Quality of life (QoL) as defined by the World Health Organization (WHO) is the individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (WHO, 1993). Health related quality of life (HRQL) in food allergic children has been assessed by both generic and specific questionnaires. Generic HRQL questionnaires compare patients with the normal population or patients with different diseases, but they are not sensitive to assess specific problems and cannot separate the impact on HRQL of the disease in question from the impact of comorbid diseases (Flokstra-de Blok & Dubois, 2009; Flokstra-De Blok *et al.*, 2010). Disease specific HRQL instruments are considered more sensitive than the generic ones because they focus on domains most relevant to the disease; they detect clinically important changes in patient's HRQL and they are used as an outcome measure (Flokstra-de Blok & Dubois, 2009). But, on the other hand, they cannot compare HRQL of patients with different diseases (Guyatt, Feeny, & Patrick, 1993). The importance of asking children themselves about their own QoL is that children and parents differ in their views, expectations and judgments about children's QoL (van Der Velde *et al.*, 2011). Self-report disease specific questionnaires allow children to report on their own HRQL, contribute to QoL improvement and to holistic treatment.

As part of the EuroPrevall project, a large European multicenter study on food allergy, a series of HRQL questionnaires for food allergic patients of all ages were developed and validated, named the Food

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Allergy Quality of Life Questionnaires (FAQLQ) (Flokstra-de Blok & Dubois, 2012). The self-report disease specific FAQLQ - Child Form (FAQLQ-CF), completed by children aged 8-12 years, measures changes in HRQL over time, compares children's receiving different treatments HRQL, and assesses several interventions effectiveness (Factor, Mendelson, Lee, Nouman, & Lester, 2012; Flokstra-de Blok *et al.*, 2009; van Der Velde *et al.*, 2012). Developed in Dutch, the FAQLQ-CF had an excellent internal consistency (Cronbach's alpha 0.94), consists of 24 negative (*i.e.* higher scores indicate poorer HRQL) items scored 0 to 6, divided into four subscales: allergen avoidance (AA), risk of accidental exposure (RAE), emotional impact (EI) and dietary restrictions (DR), significantly ($P < 0.001$) correlated with the Food Allergy Independent Measure (FAIM), a tool for cross-sectional validation on whether the FAQLQs measure what they are supposed to measure at one point in time (Flokstra-De Blok *et al.*, 2009; 2010; Flokstra-de Blok & Dubois, 2012; Wassenberg *et al.*, 2011; Wassenberg *et al.*, 2012).

FAQLQ-CF has been validated in English and French. The aim of this study was to translate it into Greek language and explore its psychometric properties.

Materials and Methods

Participants

Out of 172 physician-diagnosed food allergic children, followed-up by the Allergy Department of P&A Kyriakou Children Hospital, a national reference center serving the Athens metropolitan area, all southern Greece and the islands, 110 participated in a telephone survey (64%), aged 7.5-12.3 years [mean (SD) 10.0 (1.4)], 83 (75.5%) male, 27 (24.5%) female. All types of food allergy at different severity and symptom's appearance were present (Supplementary Table S1).

Children with any other major chronic illness (excluding asthma, hay fever or eczema) were excluded. The data were telephone collected by ZM, during 9 May to 3 June 2013. In order to prevent any impact of external factors on children's emotional domain, they were interviewed at a time out of school stressing program while interview process was kept as short as possible. A pilot study including nine of those children addressed some understanding difficulties. During the phone interview, no developmental or maturation differences were observed across the age range we sampled that might impact the results.

Ethical approval

The Scientific Committee of P&A Kyriakou Children Hospital approved the study protocol. Parents and children received written information, indicating that participation in the study was voluntary and the telephone interview was conducted after parents and their children acceptance to participate in the study.

Measures

The disease-specific FAQLQ-CF, the validated in Greek generic Pediatric QoL Inventory™ 4.0 (PedsQL™), and the Food Allergy Independent Measure (FAIM) were used (Gkoltsiou *et al.*, 2008; van Der Velde *et al.*, 2012; Varni, Seid & Kurtin, 2001). FAQLQ-CF properties were described in the Introduction. PedsQL™ is a 23-item self-report measure, divided into 4 subscales: physical functioning, emotions, social relationships, and school functioning, rated on a 5-point Likert scale, and asking about quality of life during the past month (Varni, Seid & Kurtin, 2001). The Greek version was found to be valid with good internal consistency (only the physical functioning subscale had a Cronbach's α of 0.65, slightly below 0.70; see validation second paragraph, how to interpret these values) (Gkoltsiou *et al.*, 2008).

Higher scores indicate better HRQL. FAIM is a self-report food allergy specific independent measure for children and consists of six questions scored 0 to 6. The four of them assess child's food allergy expectation outcomes, and the other two reflect aspects of the perceived severity of food allergy. Higher scores indicate poorer HRQL. A moderate correlation coefficient (0.40-0.70) between FAQLQ-CF and FAIM revealed construct validity, and a low correlation coefficient (0.10-0.30) between FAQLQ-CF and PedsQL™ convergent validity (Flokstra-de Blok *et al.*, 2009).

Translation and culture adaptation

Two independent Greek translators produced forward translations and one other bilingual translator backward translation according to WHO guidelines.

To ensure face validity, this version was given to nine 8-12 year old food allergy children to complete and declare item understanding. Children had some difficulties grasping the meaning of questions 10 (we added the auxiliary text *That is, how much it bothers you that you have to think whether you can eat a food that you may be allergic to*) and 22 (we changed the phrase *never get rid of food allergy* to the more easily understandable *might never go away*). The question *How often do you eat out?* was added to access discriminant validity. A cultural adaptation issue had occurred with the third question of FAIM; we changed the phrase *will die with lose your life*.

Validation

Exploratory factor analysis, applying principal components analysis, was implemented in order to uncover the underlying structure of the relatively large set of FAQLQ-CF items, *i.e.*, the underlying relationships between them, in our dataset (construct validity). Confirmatory factor analysis, via structural equation modeling using maximum likelihood estimation procedures with the relatively unaffected by sample size Tucker-Lewis Index (TLI) and Bollen's Incremental Fit Index (IFI) (Bollen, 1990; Gerbing & Anderson, 1993; Hu & Bentler, 1995; Marsh, Balla & McDonald, 1988), was also implemented in order to test the originally proposed four-factor structure with our data (McDonald, 1978).

The internal consistency of the instrument was assessed using Cronbach's alpha coefficient (the total scale alpha should be at least 0.70 to be acceptable, 0.80 to be good, and 0.90 to be excellent; (Clark & Watson, 1995) and the subscale alphas should be greater than corresponding expected alphas calculated using the Spearman-Brown formula), and corrected item-total correlations (Pearson's r for each subscale should be > 0.300 , otherwise the item should be removed from the questionnaire) (Field, 2011; Lyraeos, Vini, Aslani, & Drosou-Servou 2012; Norusis & SPSS Inc, 1997).

The tool's ability to differentiate among children with various QoL levels and among various components of the QoL was checked, as well as between children who reported anaphylaxis and those who did not, as the original study did. Anaphylaxis was defined as children who ever reported two or more of the following cardiovascular symptoms: dizziness, feeling your heart beat fast, loss of vision, inability to stand, light headedness, collapse, loss of consciousness/ passing out (Flokstra-de Blok *et al.*, 2009). In addition it was checked to children who reported multiple food allergies, many different symptoms, severe reactions, epinephrine prescription, rarely eating out, and doing less things with others, compared with children who reported less food allergies, less symptoms *etc.* A difference greater than a minimal clinical importance difference (MCID) of 0.5 was considered clinically significant (Flokstra-de Blok *et al.*, 2009; Jaeschke, Singer & Guyatt, 1989; Juniper, Guyatt, Willan, & Griffith, 1994).

Results

The total and subscale FAQLQ-CF scores correlated significantly but moderately (Table 1), as expected, with the total FAIM, and with the five of the six individual FAIM questions. All but one FAQLQ-CF items correlated with at least two FAIM items. The total FAQLQ-CF and its original subscales correlated low with the total PedsQL™ and moderately with one of its subscales (emotional functioning).

The factor analysis resulted in four factors that made the most sense, explaining 50% of the variance, partly confirmed the original factors (Table 2). An expert panel (ZM, ID, GL, NP) reviewed the new four factors. They could be allergen avoidance (AA, F1) and dietary restrictions (DR, F4) as in the original study, and two new ones whose names could be emotional functioning (EF, F2) and risk impact (RI, F3). All the factors had strong loadings from 0.410 to 0.768 (AA, 0.728-0.499; EF, 0.704-0.450; RI, 0.768-0.410 and DR, 0.735-0.427).

Cronbach alphas were 0.905 for the total Greek FAQLQ-CF (Table 3) and greater than expected for its subscales (except for the RAE where it was slightly less, 0.631 *vs* 0.665). Corrected item total correlations were between 0.387 and 0.709 for the total Greek FAQLQ-CF (Table 3)

and greater than 0.300 for its subscales (except for the RAE where it was between 0.243 and 0.463). Total FAIM alpha was 0.653 (acceptable), raised to 0.703 (good) after the omission of item 5 (IM1), the corrected item total correlation of which was only 0.029, indicating that this item might be removed.

FAQLQ-CF discriminated well between children who reported different QoL levels (Supplementary Figure F1) and different QoL deterioration reasons (Supplementary Figure F2). Children's QoL ranged from 0.67 (11%) in the negative 0-6 scale (reversely 89% of the best quality) to 4.95 (83%; reversely 17% of the best). QoL deteriorating reasons ranged 32-80% (questions 4, 14). Children who reported more than moderately affected in doing things with others were clinically and statistically more impacted than those who reported less than moderately affected (total FAQLQ-CF score 3.553 *vs* 2.570, difference = 0.98 > MID; $P < 0.001$; Supplementary Table S2). The same result was found for feeling angry; difference = 0.592 > MID, $P = 0.003$). There was an almost clinically and statistically significant difference in total FAQLQ-CF mean score between children who reported more than fairly chance to die and children eating out compared to those who reported less than fairly. The FAQLQ-CF score did not differ between children who reported anaphylaxis or various combinations of cardio-respiratory symptoms and children who did not. *Things done with others* was the only variable

Table 1. Spearman's correlation coefficient of the total Food Allergy Quality of life Questionnaire-Child Form (FAQLQ-CF) score and its domains and questions with the Food Allergy Independent Measure (FAIM) questions and total and with the Pediatric Quality of Life Inventory (PedsQL™) domains and total.

FAQLQ-CF	FAIM questions and total						PedsQL™ domains (subscales) and total					
	EO1	EO2	EO3	EO4	IM1	IM2	Total	PF	EF	SF	ScF	Total
Total	0.346**	0.296*	0.308**	0.413**	0.057	0.486**	0.509**	-0.138	-0.320	-0.082	-0.136	-0.224
Allergen avoidance	0.355**	0.256**	0.268**	0.334**	-0.033	0.389**	0.426**	-0.092	-0.336	-0.128	-0.108	-0.217
4 read labels	0.221*	0.219*	0.054	0.218*	0.010	0.406**	0.306**					
6 stay for a meal	0.272**	0.147	0.299**	0.204*	0.131	0.327**	0.371**					
7 try fewer things	0.257**	0.047	0.062	0.158	0.133	0.202*	0.223*					
8 tell beforehand	0.154	0.136	0.154	0.180	-0.124	0.256**	0.204*					
9 check yourself	0.266**	0.243*	0.291**	0.333**	-0.144	0.158	0.337**					
10 hesitate eating	0.337**	0.301**	0.313**	0.151	-0.062	0.273**	0.357**					
15 explain around	0.097	0.004	-0.005	0.267**	-0.059	0.214*	0.133					
Risk accidental exposure	0.347**	0.205*	0.261**	0.264**	0.009	0.409**	0.395**	-0.088	-0.301	-0.081	-0.151	-0.224
11 touching foods	0.297**	0.216*	0.135	0.082	-0.097	0.178	0.196*					
13 ingredient change	0.261**	0.231*	0.179	0.252**	-0.061	0.393**	0.321**					
14 label traces of ...	0.198*	0.019	0.109	0.112	0.034	0.280**	0.199*					
16 people forget	0.189*	-0.039	0.167	0.022	0.065	0.228*	0.177					
17 others can eat	0.168	0.254**	0.187	0.353**	0.092	0.289**	0.351**					
Emotional impact	0.277**	0.332**	0.382**	0.438**	0.100	0.409**	0.519**	-0.068	-0.232	-0.039	-0.096	-0.154
19 allergic reaction?	0.239*	0.348**	0.276**	0.283**	0.044	0.230*	0.373**					
20 eating wrong	0.100	0.316**	0.272**	0.284**	0.034	0.232*	0.325**					
21 never before	0.200*	0.142	0.225*	0.169	0.216*	0.297**	0.336**					
22 never get rid	0.273**	0.270**	0.253**	0.318**	-0.024	0.322**	0.376**					
23 not taking account	0.199*	0.248**	0.155	0.298**	0.103	0.321**	0.338**					
24 have food allergy	0.254**	0.228*	0.318**	0.426**	0.104	0.332**	0.450**					
Dietary restriction	0.166	0.226*	0.196*	0.377**	0.185	0.456**	0.419**	-0.245*	-0.269*	-0.061*	-0.132*	-0.226*
1 always watch	0.072	0.141	0.052	0.200*	0.152	0.215*	0.190*					
2 eating fewer things	0.121	0.201*	0.126	0.269**	0.139	0.299**	0.299**					
3 limited in buying	0.071	0.128	0.104	0.202*	0.266**	0.302**	0.282**					
5 refuse food	0.178	0.183	0.178	0.280**	0.041	0.307**	0.313**					
12 don't get treats	0.115	0.111	0.111	0.329**	0.217*	0.404**	0.326**					
18 don't know taste	0.086	0.084	0.065	0.187*	0.000	0.288**	0.184					

Correlation is significant at the *0.05/**0.01 level (2-tailed). We also performed 1-tailed analysis and the results are very similar; all correlations remain the same and only 32 significant at the 0.05 level values became significant at the 0.01 level (see Supplementary Table S3). EO: child's food allergy expectation outcome. IM: independent measure. EO1: How big do you think the chance is that you will accidentally eat something to which you are allergic? EO2: How big do you think the chance is that you will have a severe reaction if you accidentally eat something to which you are allergic? EO3: How big do you think the chance is that you will die if you accidentally eat something to which you are allergic? EO4: How big do you think the chance is that you can *not* do the right things for your allergic reaction, should you accidentally eat something to which you are allergic? IM 1: How many foods are you unable to eat because of your food allergy? IM 2: How much does your food allergy affect things you do with others? PF: physical functioning, EF: emotional functioning, SF: social functioning, ScF: school functioning.



Table 2. Confirmatory factor analysis: loadings (>0.4) in each of our four factors (F1 to F4) for each question (Q); the original factor (OF) for each question is also given.

Q	OF	F1	F2	F3	F4	Item
3	DR	0.735				Limited in buying
2	DR	0.726				Eating fewer things
18	DR	0.628				Refuse food
20	DR	0.591				Don't get treats
6	AA	0.545				Try fewer things
1	DR	0.427				Always watch
23	EI		0.704			Never get rid
22	DR		0.681			Don't know taste
13	RAE		0.671			Others can eat
24	EI	0.414	0.631			Have food allergy
17	EI		0.583			Not taking account
5	AA		0.492			Stay for a meal
10	RAE		0.450			Ingredient change
15	EI			0.768		Eating wrong
14	EI			0.747		Allergic reaction
9	RAE			0.590		Touching foods
16	EI			0.578		Never eaten
21	RAE			0.496		People forget
8	AA			0.492		Hesitate eating
11	RAE			0.410		Label <i>traces of</i> ...
12	AA				0.728	Explain around
19	AA				0.723	Tell beforehand
4	AA	0.456			0.561	Read labels
7	AA				0.499	Check yourself

Extraction method: principal component analysis. Rotation method: Varimax with Kaiser normalization. Rotation converged in 6 iterations for CFA and in 18 for EFA. Extract: number of factors 4 for CFA, Eigenvalues over 1 for EFA. Coefficient display format: sorted by size; suppress absolute value less than 0.4. The EI 24 and AA 4 were the only items with loading higher than 0.400 in two different factors.

Table 3. Cronbach's alpha and corrected item-total correlation for Food Allergy Quality of life Questionnaire-Child Form (FAQLQ-CF), Pediatric Quality of Life Inventory (PedsQL™), and Food Allergy Independent Measure (FAIM).

Scale/Subscale	It	Cronbach's alpha (α)			Corrected item-total correlation**
		Obs	Exp*	Orig	
FAQLQ-CF (total scale)	24	0.905		0.94	0.387-0.709
Allergen avoidance	7	0.775	0.735	0.88	0.413-0.601
Risk of accidental exposure	5	<i>0.631</i> [†]	0.665	0.82	0.243-0.463
Emotional impact	6	0.758	0.705	0.87	0.428-0.592
Dietary restrictions	6	0.747	0.705	0.83	0.353-0.587
Factor 1 (DR)	6	0.775	0.705		0.419-0.602
Factor 2 (EF)	7	0.826	0.735		0.511-0.711
Factor 3 (RI)	7	0.764	0.735		0.443-0.601
Factor 4 (AA)	4	0.713	0.615		0.448-0.623
First half (questions 1-12)	12	0.845	0.827		0.349-0.641
Second half (questions 13-24)	12	0.837	0.827		0.405-0.684
Odd (questions 1, 3, 5, ..., 23)	12	<i>0.805</i>	0.827		0.351-0.542
Even (questions 2, 4, 6, ..., 24)	12	0.836	0.827		0.363-0.684
PedsQL™ (total scale)	23	0.887 [°]		>0.70 ^{°°}	0.216-0.684
Physical functioning	8	0.775 [°]	0.732	0.65 ^{°°}	0.336-0.636
Emotional functioning	5	0.734 [°]	0.631	>0.70 ^{°°}	0.392-0.623
Social functioning	5	0.809	0.631	>0.70 ^{°°}	0.534-0.661
School functioning	5	0.717 [°]	0.631	>0.70 ^{°°}	0.290-0.682
FAIM (total scale)	6	0.653 [°]			0.029-0.601
OE	4	0.706	0.616		0.433-0.580
IM	2	<i>0.194</i>	0.445		negative - negative

It, number of items; Obs, observed (in italics where obs<exp); Exp, expected; Orig, original, *i.e.*, Flokstra *et al.* (2009) for FAQLQ-CF, Gkoltsiou *et al.* (2008) for PedsQL™, and Van der Velde *et al.* (2010) for FAIM.

*Expected subscale alphas were calculated using the Spearman-Brown formula $\alpha_{subscale} = k\alpha_{scale}/(1+(k-1)\alpha_{scale})$, where k is the number of items of the subscale divided by the number of items of the overall scale.^{1,10}

**Range of Pearson correlation coefficients r. For example, in the first line, the 24 r coefficients for the FAQLQ-CF (total scale) range 0.387 (for the question 11 «How *troublesome* is it, because of your food allergy, that the label states: "May contain traces of ...?"») to 0.709 (for the question 24 «How *disappointed* do you feel because you have a food allergy?»). Similarly the 23 r coefficients for the PedsQL™ (total scale) range 0.216 to 0.684. And the 6 r coefficients for the FAIM (total scale) range 0.029 (for the question 5 «How many foods are you unable to eat because of your food allergy?») to 0.601 (for the question 2 «How big do you think the chance is that you will have a severe reaction if you accidentally eat something to which you are allergic?»). [°]0.631 increased to 0.644 (greater than expected 0.615) if item 17 was deleted; 0.887 to 0.890 if item 11 and to 0.888 if item 23 was deleted; 0.775 to 0.788 if item 7 was deleted; 0.734 to 0.736 if item 11 was deleted; 0.717 to 0.730 if item 22 was deleted; and 0.653 to 0.703 if item 5 was deleted; no other observed alpha increased after deletion of any of the items for any of the other scales or subscales. ^{°°}All self-report and proxy-report scales of PedsQL™ 4.0, except for physical functioning self-report (a = 0.65), exceeded the minimum reliability standard of 0.70.²⁸

that affected clinically and statistically the mean FAIM-OE score (the difference disappeared if the IMI question was added), and the mean PedsQL™ score. The statistically ($P=0.035$) significantly worse mean PedsQL™ score in older children was also clinically significant [absolute $(-0.18) > 0.1744 = \text{MID}$].

Discussion

Content validity, the extent to which a measure represents all facets of a given social construct, perhaps the most important thing of a questionnaire, was addressed by the original study. Thus, we focused on questionnaire's translation and cultural adaptation in Greek.

Construct validity refers to whether the questionnaire is measuring what it is supposed to measure and can be assessed by correlating a new questionnaire with an independent measure which reflects disease severity (van der Velde *et al.*, 2010). The significant correlation between FAQLQ-CF and FAIM assures construct validity, fits with Floskra de Blok and Wassenberg, and demonstrates that Greek FAQLQ-CF is measuring the food allergy affected QoL (Flokstra-de Blok *et al.*, 2009; Wassenberg *et al.*, 2011). As in the original study, we supplemented statistical factoring by face validity (Flokstra-de Blok *et al.*, 2009).

Cronbach alpha for the total Greek FAQLQ-CF (0.905) indicates an excellent reliability (Fayers & Machin, 2000). Tavakol and Dennick argue that an alpha > 0.90 may suggest redundancies and show that the tool's length should be shortened (Tavakol & Dennick, 2011). No alpha if item deleted was greater than without deletion, an indication of no redundancies. Item-total Pearson's correlations showed that all items are well related ($r > 0.300$), an indication of no need for any item to be removed (except an item in RA with $r = 0.243$, considered by the expert panel as important for the questionnaire).

The questionnaire discriminates between various QoL levels and various QoL components. Thus, it could serve as a helpful additional tool, as a good first step, for clinicians to manage children's allergy. It also discriminates well between children who reported more than and less than moderately affected in doing things with others. There was no difference according to eating out, chance to die, feeling angry and age. Children who reported anaphylaxis did not differ with children who did not report anaphylaxis, as also Floskra de Blok *et al.* found (Flokstra-de Blok *et al.*, 2009). One possible explanation could be that the children who reported anaphylaxis were only four; however we found no difference after broadening the anaphylaxis definition. Also there was no difference according to one or multiple food allergies, as Wassenberg *et al.* and Floskra de Blok *et al.* found (Flokstra-de Blok *et al.*, 2009; Wassenberg *et al.*, 2011).

Total FAQLQ-CF score correlated with the total PedsQL™ and with one of its four subscales, the emotional functioning. Surprisingly, the two emotional subscales, FAQLQ-CF emotional impact and PedsQL™ emotional functioning had the lowest correlation ($\rho = 0.232$) and less significance; we have no explanation for this. The presence of some correlation between FAQLQ-CF and PedsQL™ indicates that both are measuring constructs partly related (*i.e.* convergent validity) (Flokstra-de Blok *et al.*, 2009). On the other hand, the (as expected) low correlations indicate that the generic PedsQL™ is not as sensitive as the disease-specific FAQLQ-CF (*i.e.* discriminant validity) (Flokstra-de Blok & Dubois, 2009).

Limitations

The data were collected by telephone. The phone interview is quick, convenient and can effectively cover all southern Greece and the islands at the lowest cost. However it needs more caution to time limi-

tations and intra-interviewer variability. To reduce time limitations all phone calls were made at a predetermined time after consultation of the interviewer and the parent, and we did our best to keep intra-interviewer variability to a minimum. Future research could clarify whether our final product can also be used for face-to-face, paper or electronic administration.

The study had a sample almost at the lowest numerical limit needed for factor analysis (110 instead 120); though the difference could reasonably be considered negligible, as the sampling adequacy diagnostics found (Stevens, 2002), and though that ours was bigger than the other validation studies sample (79 and 32 respectively), (Flokstra-De Blok *et al.*, 2009; Wassenberg *et al.*, 2011). We used factor analysis with the relatively unaffected by sample size TLI and IFI (Bollen, 1990; Gerbing & Anderson, 1993; Hu & Bentler, 1995; Marsh, Balla & McDonald, 1988). To check discriminant ability the questionnaire should be administered to known groups with good and poor QoL; we didn't have such groups and reached to conclusions indirectly using reasonable hypotheses, as the original and translation studies also did (Flokstra-de Blok *et al.*, 2009; Wassenberg *et al.*, 2011). Finally, we didn't check tool's responsiveness; its good discriminant ability is an indirect evidence of it (Fayers & Machin, 2000).

Conclusions

Concluding, this study showed that the Greek FAQLQ-CF, the European standard questionnaire on food allergic children, has satisfactory validity, reliability, and discriminant ability. The tool could help clinicians to detect children in need for immediate care and children's deterioration reasons.

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