

Health-related quality of life of food allergic patients measured with generic and disease-specific questionnaires

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To cite this article: Flokstra-de Blok BMJ, van der Velde JL, Vlieg-Boerstra BJ, Oude Elberink JNG, DunnGalvin A, Hourihane JO'B, Duiverman EJ, Dubois AEJ. Health-related quality of life of food allergic patients measured with generic and disease-specific questionnaires. *Allergy* 2010; **65**: 1031–1038.

Keywords

Disease-specific questionnaires; EuroPrevall; Food allergy; Food Allergy Quality of Life Questionnaire (FAQLQ); Generic questionnaires; Health-related quality of life.

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Accepted for publication 17 November 2009

DOI:10.1111/j.1398-9995.2009.02304.x

Edited by: Bodo Niggemann

Abstract

Background: Health-related quality of life (HRQL) has never been measured with both generic and disease-specific questionnaires in the same group of food allergic patients. The aim of this study was to compare HRQL of food allergic patients as measured with generic and disease-specific questionnaires.

Methods: Generic questionnaires (CHQ-CF87 and RAND-36) and disease-specific HRQL questionnaires (FAQLQ-CF, -TF and -AF) were completed by 79 children, 74 adolescents and 72 adults with food allergy. Floor and ceiling effects, percentage of agreement and multivariate stepwise regression analysis were used to compare the generic and disease-specific measurements.

Results: The Food Allergy Quality of Life Questionnaires (FAQLQs) showed minimal floor or ceiling effects. The CHQ-CF87 and RAND-36 showed minimal floor effects, but remarkable ceiling effects (>73%) were found for the scales role functioning-emotional (RE), role functioning-behaviour (RB), role functioning-physical (RP) in children and adolescents and the scale RE (>79%) in adults. Additionally, we found low percentages of agreement between the generic and disease-specific questionnaires to identify the same food allergic patients with the best or worst HRQL. Only patients with the best disease-specific HRQL also tended to have the best generic HRQL. Finally, the explained variance in HRQL by patient characteristics was higher in the disease-specific questionnaires (30.7–62.8%) than in the generic scales (6.7–31.7%).

Conclusion: Disease-specific HRQL questionnaires may be more suitable to measure clinically important impairments in HRQL or HRQL differences over time in food allergic patients. However, generic HRQL questionnaires are indispensable for the comparison between different diseases and are thus complementary.

Although food allergic patients may experience symptoms only intermittently, they must maintain a high degree of vigilance to prevent exposure to foods to which they are allergic. This may be a great burden to themselves and their families (1, 2). Despite taking precautions, there is always a chance of accidental exposure and for some patients such exposure may be fatal (3). Consequently, food allergy has a significant impact on health-related quality of life (HRQL) (4).

HRQL can be measured with two types of questionnaires: generic and disease-specific questionnaires. Generic question-

naires can be used to evaluate and compare different diseases. The disadvantages of generic questionnaires are that they may not focus adequately on problems specific to a particular disease and that they simultaneously measure the impact of comorbid diseases. Disease-specific instruments, as their name implies, are targeted to a specific disease. These disease-specific questionnaires are more likely to detect clinically important impairments specific for a particular disease or HRQL differences over time. However, disease-specific questionnaires do not allow direct comparison between different

diseases (5). In food allergy, HRQL is the only available measure that reflects the ongoing perceived severity of this disorder, because no objective disease parameters are available that reflect the ongoing severity (6).

In food allergy research, a number of studies have investigated the impact of food allergy on HRQL (7–15). Only, one of these studies used both generic and disease-specific questionnaires in food allergic children (13). However, the disease-specific questionnaire used in that study was not assessed for validity and reliability. As valid and reliable self-administered disease-specific HRQL questionnaires for food allergic patients have become available only recently (16–19), the administration of both generic and disease-specific instruments to the same population of food allergic patients is now possible.

Therefore, the aim of this study was to investigate the impact of food allergy on HRQL as measured with generic and disease-specific questionnaires in children (8–12 years), adolescents (13–17 years) and adults (≥ 18 years).

Methods

Participants

The children (8–12 years), adolescents (13–17 years) and adults (≥ 18 years) that participated in the present study were part of the studies on the cross-sectional validation of the Food Allergy Quality of Life Questionnaire-Child Form, -Teenager Form and -Adult Form (FAQLQ-CF, -TF and -AF) (17–19). These participants had a physician-diagnosed food allergy for at least one food and were recruited from our outpatient (paediatric) allergy clinic or were recruited through food allergy support organizations (the Dutch Foundation for Food Allergy and the Dutch Anaphylaxis Network) and by advertisement in local newspapers. Forty-seven children (59%), 43 adolescents (58%) and 42 adults (58%) were recruited from our allergy outpatient clinic. The food allergy was confirmed by a double-blind placebo-controlled food challenge (DBPCFC) in 25 children (31%), 19 adolescents (26%) and 14 adults (19%). The other patients had a physician-diagnosed food allergy based on history and skin prick and/or blood test. The majority of them were awaiting a DBPCFC. All patients recruited by advertisement [32 children (41%), 31 adolescents (42%) and 30 adults (42%)] reported physician-diagnosed food allergies. The most common types of food allergies and different types and severities of symptoms were represented in the study sample. The study was reviewed by the local medical ethical committee (METc 2005/051) who deemed that approval was not needed.

Procedure

The HRQL questionnaires (the age appropriate generic and disease-specific questionnaire), the Food Allergy Independent Measure (FAIM) (20) and descriptive questions on age, sex, type and number of food allergies, type of symptoms and diagnosis were sent by mail to be completed at home. Participants were not paid for their participation. The children

(8–12 years) and their parents were instructed that the children should fill out the questionnaires by themselves. Parents were allowed to explain a question when needed, but they were not allowed to tell the child which answer to give. For completing the descriptive questions, parents were allowed to help their child when needed. The FAIM measures the patients' perceived expectation of outcome. It was used as a validation measure in the studies on the development and validation of the Food Allergy Quality of Life Questionnaire (FAQLQs) (17–19).

Questionnaires

Generic HRQL questionnaires

In children and adolescents, the Child Health Questionnaire-Child Form (CHQ-CF87) was administered (21, 22). This questionnaire is self-administered by the child and contains 87 items divided into 12 scales (Table 1). After recoding the raw scores, scale scores are computed and transformed into a 100-point scale. Higher scores indicate better HRQL.

In adults, we administered the RAND-36, which is the Dutch translation of the MOS 36-item Short-Form Health Survey (23, 24). The RAND-36 consists of 36 items divided into nine scales (Table 1). After recoding the raw scores, scale scores are computed and transformed into a 100-point scale. Higher scores indicate better HRQL.

Disease-specific HRQL questionnaires

The disease-specific HRQL questionnaires used in this study were the FAQLQ-CF for children aged 8–12, the FAQLQ-TF for adolescents aged 13–17 and the FAQLQ-AF for adults aged 18 and older (17–19). All three questionnaires were validated in the Netherlands and showed excellent reliability (25). These questionnaires consist of 24, 23 and 29 items, respectively, divided into 4, 3 and 4 domains (Table 1). The raw FAQLQ scores 0–6 were recoded as 1–7. The total score is the mean of all items of each questionnaire and ranges from 1 (minimal impairment of HRQL) to 7 (maximal impairment of HRQL). Thus, higher scores indicate poorer HRQL.

Statistical analysis

Statistical analyses were performed with SPSS for Windows 14.0 (SPSS Inc., Chicago, IL, USA). Domain scores for the CHQ-CF87 and RAND-36 were calculated (21, 23), and total scores and domain scores were calculated for the FAQLQs (17–19). Additionally, floor and ceiling effects (percentage of patients with the minimal or maximal score, respectively) of the generic and disease-specific questionnaires were investigated. The floor and ceiling of the generic CHQ-CF87 and RAND-36 were a score of 0 and 100, while these were a score of 1 and 7 for the disease-specific FAQLQs. To investigate whether generic and disease-specific HRQL questionnaires identify the same patients, we identified the 10% of patients with the best HRQL and the 10% of patients with the worst HRQL as measured with the generic and disease-specific questionnaires and compared these. Finally, to investigate the extent to which patient characteristics explain generic and

Table 1 Scales of the generic and disease-specific Health-related quality of life (HRQL) questionnaires, number of items and the mean (SD) score in food allergic patients

HRQL questionnaires	Abbreviation	No. of items	Mean (SD)	
CHQ-CF87 (Children and adolescents)		87	Children	Adolescents
Physical functioning	PF	9	96.0 (8.2)	94.4 (10.5)
Role functioning-emotional	RE	3	94.9 (14.3)	91.4 (18.4)
Role functioning-behaviour	RB	3	95.1 (12.7)	94.3 (15.4)
Role functioning-physical	RP	3	94.9 (14.2)	92.9 (20.9)
Bodily pain	BP	2	76.8 (24.7)	70.0 (23.3)
General behaviour	BE	17	84.0 (12.5)	80.6 (10.4)
Mental health	MH	16	78.5 (13.1)	74.6 (13.7)
Self-esteem	SE	14	79.4 (13.8)	70.8 (14.4)
General health	GH	12	72.0 (19.2)	64.4 (18.8)
Family activities	FA	6	86.9 (14.7)	84.8 (16.1)
Family cohesion	FC	1	80.9 (18.6)	73.4 (21.3)
Change in health*	CH	1		
RAND-36 (SF-36) (Adults)		36	Adults	
Physical functioning	PF	10	86.1 (18.9)	
Social functioning	SF	2	75.5 (23.8)	
Role functioning-physical	RP	4	70.8 (40.2)	
Role functioning-emotional	RE	3	83.8 (34.0)	
Mental health	MH	5	75.2 (16.1)	
Vitality	VT	4	60.1 (19.0)	
Bodily pain	BP	2	79.4 (22.4)	
General health	GH	5	56.8 (23.1)	
Change in health*	CH	1		
FAQLQ-CF (Children)		24	3.96 (1.41)	
Allergen avoidance	AA	7	3.62 (1.56)	
Risk of accidental exposure	RAE	5	4.18 (1.73)	
Emotional impact	EI	6	4.00 (1.70)	
Dietary restrictions	DR	6	4.21 (1.56)	
FAQLQ-TF (Adolescents)		23	4.15 (1.18)	
Allergen avoidance and dietary restrictions	AADR	10	3.96 (1.38)	
Risk of accidental exposure	RAE	6	4.19 (1.30)	
Emotional impact	EI	7	4.40 (1.47)	
FAQLQ-AF (Adults)		29	4.48 (1.31)	
Allergen avoidance and dietary restrictions	AADR	11	4.90 (1.37)	
Risk of accidental exposure	RAE	8	4.34 (1.44)	
Emotional impact	EI	7	4.47 (1.61)	
Food allergy related health	FAH	3	3.78 (1.73)	

The CHQ-CF87 and RAND-36 (SF-36) scores are based on a 100-point scale, where 100 is the best possible score (best HRQL). The Food Allergy Quality of Life Questionnaire (FAQLQ)-CF, -TF and -AF scores are based on a 7-point scale, where 1 is the best possible score (best HRQL).

*Not used in this study.

disease-specific HRQL, we performed multivariate stepwise regression analysis. The disease-specific FAQLQs and two scales of the generic CHQ-CF87 and RAND-36 were used as dependent variables. The patient characteristics were used as independent variables. Adjusted R^2 was used to describe the degree of variance in HRQL explained by the model in percentage. We choose the two generic scales with the highest and the lowest correlation with the disease-specific FAQLQs (17–19), because these scales indicate the generic scales with the most and least agreement with the disease-specific FAQLQs, respectively.

Results

Participants

The questionnaire packages including the FAQLQs and the age appropriate generic HRQL questionnaires were sent to 312 participants divided over the three age groups. Response rates were high: children 84/114 (73%), adolescents 75/98 (77%) and adults 80/100 (80%). A few returned questionnaires were excluded from the analysis because (i) no current food allergies were reported (three children and one adult), or (ii) no physician-diagnosed food allergy was reported

(seven adults), or (iii) the descriptive characteristics were missing (one child and one adolescent), or (iv) the generic questionnaire was not completed (one child). Therefore, 225 participants were included in the final analysis. The mean (SD) scores of the CHQ-CF87, RAND-36 and FAQLQs are presented in Table 1. Table 2 presents the descriptive characteristics of the participants.

Floor and ceiling effects

In children, the CHQ-CF87 showed almost no floor effects because the minimal score (worst HRQL) was seldom reported (Table 3). However, remarkable ceiling effects were seen for the scales role functioning-emotional (RE), role functioning-behaviour (RB) and role functioning-physical (RP) where more than 80% of the children reported the maximal score (best HRQL). A similar pattern was seen in adolescents. In adults, the RAND-36 showed some floor effects (worst HRQL), and pronounced ceiling effects (best HRQL), especially for the scale RE (79%). The disease-specific FAQLQs and domains showed minimal if any floor or ceiling effects, indicating that almost no food allergic patients reported the minimal FAQLQ score (best HRQL) or maximal FAQLQ score (worst HRQL), respectively. This indicates that these questionnaires are potentially longitudinally responsive to the specific concerns of food allergic patients, and it underscores the internal validity of these questionnaires.

Percentage of agreement

Disease-specific questionnaires as starting point

Table 4 presents the percentage of agreement of the 10% of patients with the worst or best HRQL identified by the disease-specific FAQLQs. For example, of the 10% of children with the worst disease-specific HRQL measured with the FAQLQ-CF, 25% of them also had the worst generic HRQL as measured with the CHQ-CF87 scale physical functioning (PF). The agreement between the 10% of patients with the best disease-specific HRQL and best generic HRQL was generally higher than the agreement between the 10% of patients with the worst disease-specific HRQL and worst generic HRQL.

Generic questionnaires as starting point

When taking the generic questionnaires as starting point, we found that of the 10% of children with the worst HRQL measured with the CHQ-CF87 scales, 0% (FC) to 44% (RP) of them also had the worst disease-specific HRQL as measured with the FAQLQ-CF. Of the 10% of adolescents with the worst HRQL measured with the CHQ-CF87 scales, 11% (RE) to 57% (SE) of them also had the worst disease-specific HRQL as measured with the FAQLQ-TF. Of the 10% of adults with the worst HRQL measured with the RAND-36 scales, 14% (PF) to 44% (VT) of them also had the worst disease-specific HRQL as measured with the FAQLQ-AF. However, it was not possible to accurately identify the 10% of patients with the best HRQL for the

majority of CHQ-CF87 or RAND-36 scales, because many patients scored the maximal score of 100, which indicates the best generic HRQL (see also Table 3 on ceiling effects).

Generic and disease-specific HRQL explained by patient characteristics

The explained variance in HRQL was higher in the disease-specific questionnaires, ranging from 30.7% for the FAQLQ-TF to 62.8% for the FAQLQ-AF, than in the generic scales (Table 5). Even in the generic scales that correlated the best

Table 2 Descriptive characteristics of the food allergic participants ($n = 225$)

	Children	Adolescents	Adults
Patients, n	79	74	72
Sex, m/f	45/34	34/40	18/54
Age, mean (SD), years	10.2 (1.3)	14.7 (1.3)	37.2 (14.3)
Age range (years)	8–12	13–17	18–72
Type of food allergies, n (%)			
Peanut	59 (74)	57 (77)	42 (58)
Tree nut	57 (72)	56 (76)	42 (58)
Egg	29 (37)	26 (35)	16 (22)
Milk	22 (28)	29 (39)	19 (26)
Fish	2 (3)	13 (18)	11 (15)
Shell fish	7 (9)	12 (16)	12 (17)
Wheat	10 (13)	5 (7)	12 (17)
Sesame	14 (18)	8 (11)	13 (18)
Soy	12 (15)	17 (23)	13 (18)
Celery	1 (1)	3 (4)	11 (15)
Fruits	29 (37)	38 (51)	35 (49)
Vegetables	14 (18)	22 (30)	27 (38)
Other*	15 (19)	20 (27)	30 (42)
Number of food allergies, n (%)			
1 food	15 (19)	9 (12)	12 (17)
2 foods	16 (20)	12 (16)	14 (19)
3 foods	16 (20)	15 (20)	8 (11)
>3 foods	32 (41)	38 (51)	38 (53)
Type of symptoms, n (%)			
Cardiovascular symptoms†	28 (35)	31 (58)	44 (61)
Respiratory symptoms‡	56 (71)	61 (82)	60 (83)
Gastrointestinal symptoms§	49 (62)	47 (64)	48 (67)
Skin symptoms¶	69 (87)	60 (81)	55 (76)
Other#	66 (84)	66 (89)	62 (86)

*E.g. lupine, kernels and seeds, herbs and spices, meat.

†Dizziness, feeling your heart beat fast, loss of vision, inability to stand, light headedness, collapse, loss of consciousness/passing out.

‡Tightening throat, difficulty swallowing, hoarseness/hoarse voice, difficulty breathing in, shortness of breath, wheezing, cough.

§Nausea, stomach cramps, vomiting, diarrhoea.

¶Itchy skin, red rash, urticaria, worsening eczema, swelling of the skin.

#Oral allergy, swollen tongue or lips, symptoms of the nose or eyes.

Table 3 Percentage of floor and ceiling effects of the CHQ-CF87, RAND-36 and FAQLQ-CF, -TF and -AF

Children			Adolescents			Adults		
	Floor, (%)	Ceiling, (%)		Floor, (%)	Ceiling, (%)		Floor, (%)	Ceiling, (%)
CHQ-CF87			CHQ-CF87			RAND-36		
PF	0	64.8	PF	0	58.1	PF	0	26.0
RE	1.3	81.0	RE	1.4	73.0	SF	1.4	23.0
RB	0	82.3	RB	0	81.1	RP	19.4	58.3
RP	0	86.1	RP	2.7	85.1	RE	11.1	79.2
BP	0	41.8	BP	1.4	20.3	MH	0	2.8
BE	0	5.1	BE	0	0	VT	0	1.4
MH	0	2.6	MH	0	0	BP	0	37.5
SE	0	6.3	SE	0	0	GH	0	2.8
GH	0	3.8	GH	0	0			
FA	0	31.6	FA	0	24.3			
FC	0	25.3	FC	0	23.0			
FAQLQ-CF			FAQLQ-TF			FAQLQ-AF		
AA	1.3	0	AADR	0	1.4	AA	1.4	0
RAE	2.5	3.8	RAE	1.4	2.7	AADR	2.8	0
EI	5.1	1.3	EI	0	1.4	RAE	1.4	1.4
DR	2.5	2.5				EI	1.4	1.4
						FAH	6.9	4.2

Floor effect = percentage of patients with minimal score.

Ceiling effect = percentage of patients with maximal score.

Floor and ceiling of CHQ-CF87 and RAND-36 are score 0 (worst Health-related quality of life (HRQL)) and 100 (best HRQL), respectively.

Floor and ceiling of the Food Allergy Quality of Life Questionnaire (FAQLQ)-CF, -TF and -AF are score 1 (best HRQL) and 7 (worst HRQL), respectively.

PF, Physical functioning; RE, Role functioning-emotional; RB, Role functioning-behaviour; RP, Role functioning-physical; BP, Bodily pain; BE, General behaviour; MH, Mental health; SE, Self-esteem; GH, General health; FA, Family activities; FC, Family cohesion; SF, Social functioning; VT, Vitality; AA, Allergen avoidance; RAE, Risk of accidental exposure; EI, Emotional impact; DR, Dietary restrictions; AADR, Allergen avoidance and dietary restrictions; FAH, Food allergy related health.

with the FAQLQs, family activities (FA) in children and adolescents and mental health (MH) in adults respectively, the explained variance in HRQL was lower than in the disease-specific questionnaires, ranging from 14.5% for FA in children to 26.2% for MH in adults.

In the disease-specific FAQLQs, the mean FAIM had the most pronounced association with HRQL (higher score indicates greater impact on HRQL). This was also seen in the generic FA and MH scale, but here the association was negative because a higher score on the generic questionnaires indicates a better HRQL. Interestingly, having more severe symptoms was associated with a better MH score in adults. Type of food allergy, defined as a dichotomous variable peanut allergy versus other food allergies, showed no significant association with HRQL (not shown).

Discussion

In this study, we found very high ceiling effects for some scales of the generic questionnaires. No significant floor or ceiling effects were found for the disease-specific FAQLQs. Additionally, we found generally low percentages of agreement between the generic and disease-specific questionnaires in the identification of the same food allergic patients with the best or worst HRQL. Only patients with the best disease-

specific HRQL also tended to score the best generic HRQL. Finally, the explained variance in HRQL by patient characteristics was higher for the disease-specific questionnaires than for the generic scales.

One of the disadvantages of generic questionnaires is that they are by design comprehensive, so they may not focus adequately on problems specific to a particular disease. In the current study, we found very high ceiling effects for some scales of the generic questionnaires, which indicate that a substantial part of the food allergic patients reported no problems in these areas. Thus, some areas measured by generic questionnaires are irrelevant to food allergy. Generic questionnaires may therefore be not useful for measuring disease-specific clinically important impairments in HRQL or HRQL differences over time in food allergic patients. In contrast, no significant floor or ceiling effects were observed for the disease-specific FAQLQs. This indicates that these questionnaires are potentially longitudinally responsive to the specific concerns of food allergic patients, and it underscores the internal validity of these questionnaires.

Furthermore, we found that patients with the best disease-specific HRQL also tended to score the best generic HRQL (high percentage of agreement). However, patients with the worst disease-specific HRQL do not always have the worst generic HRQL (low percentage of agreement). A possible

Table 4 Percentage of agreement of the 10% of patients with the worst* or best†, Health-related quality of life (HRQL) identified by the disease-specific questionnaires

	CHQ-CF87										
	PF	RE	RB	RP	BP	BE	MH	SE	GH	FA	FC
FAQLQ-CF											
Worst*, %	25	38	13	13	13	13	25	50	25	13	0
Best†, %	63	75	75	88	63	13	13	13	0	38	13
FAQLQ-TF											
Worst*, %	14	14	14	14	14	29	29	57	14	29	14
Best†, %	71	100	100	100	43	29	29	43	14	71	43
RAND-36											
FAQLQ-AF											
Worst*, %	14	43	43	43	29	29	14	0			
Best†, %	14	14	71	71	29	0	14	0			

*Worst = the 10% of patients with the highest scores on the Food Allergy Quality of Life Questionnaire (FAQLQs), thus the worst HRQL.

†Best = the 10% of patients with the lowest scores on the FAQLQs, thus the best HRQL.

PF, Physical functioning; RE, Role functioning-emotional; RB, Role functioning-behaviour; RP, Role functioning-physical; BP, Bodily pain; BE, General behaviour; MH, Mental health; SE, Self-esteem; GH, General health; FA, Family activities; FC, Family cohesion; SF, Social functioning; VT, Vitality.

Table 5 Results of the multivariate regression analysis of the disease-specific and generic Health-related quality of life (HRQL) questionnaires

		CHQ-CF87	
	FAQLQ-CF	FA ($r = -0.45$)	PF ($r = 0.13$)
Children			
Explained variance, % *	36.1	14.5	n.s.
Intercept	1.24	105.5	n.s.
Mean FAIM	0.74 ($P < 0.001$)	-3.3 ($P = 0.019$)	n.s.
Severity of symptoms	n.s.	n.s.	n.s.
Number of food allergies	n.s.	-2.5 ($P = 0.0013$)	n.s.
			CHQ-CF87
	FAQLQ-TF	FA ($r = -0.43$)	RE ($r = -0.15$)
Adolescents			
Explained variance, % *	30.7	22.1	6.7
Intercept	0.37	96.4	99.3
Mean FAIM	0.61 ($P < 0.001$)	n.s.	n.s.
Severity of symptoms	0.23 ($P = 0.029$)	n.s.	n.s.
Number of food allergies	n.s.	-3.8 ($P < 0.001$)	-2.6 ($P = 0.015$)
			RAND-36
	FAQLQ-AF	MH ($r = -0.27$)	BP ($r = 0.01$)
Adults			
Explained variance, % *	62.8	26.2	5.2
Intercept	-0.63	79.9	88.4
Mean FAIM	0.83 ($P < 0.001$)	-8.5 ($P < 0.001$)	n.s.
Severity of symptoms	0.13 ($P = 0.024$)	4.6 ($P = 0.002$)	n.s.
Number of food allergies	0.26 ($P = 0.003$)	n.s.	-3.4 ($P = 0.030$)

*based on adjusted R^2

n.s. = not significant

FA, Family activities; PF, Physical functioning; RE, Role functioning-emotional; MH, Mental health; BP, Bodily pain; FAIM, Food Allergy Independent Measure; FAQLQ, Food Allergy Quality of Life Questionnaire.

explanation is that coping strategy differences may modify scores in severely affected patients, while this is not the case in relatively unaffected patients. The same result was found when comparing the RAND-36 with disease-specific questionnaires in patients with diabetes mellitus type 1 (26). Again, this low percentage of agreement suggests that the disease-specific questionnaires are more capable of capturing the specific aspects that impair HRQL in a food allergy than the broader generic questionnaires. This implies that if one wishes to identify or select food allergic patients with the worst HRQL, the type of questionnaire will influence which patients are identified (26).

When looking at the results of the regression analyses, we found that the FAIM had a more pronounced association with HRQL than the clinical patient characteristics such as severity of symptoms and number of food allergies. Even the type of food allergy showed no association with HRQL. This underlines our premise published earlier that objective parameters in food allergy are not as closely linked to HRQL of food allergic patients as the FAIM scores (6) and that these objective measures are thus less appropriate as an independent measure for the development of HRQL instruments in food allergy (20).

Although generic HRQL questionnaires may be not as sensitive as disease-specific questionnaires, the advantages of generic questionnaires are that they can be used to compare patients with the general population and that they can be used to compare different diseases (27). In a previous study, we showed that, in general, food allergic patients reported poorer HRQL than the general population. Additionally, it was shown that generic HRQL was more impaired in food allergic patients than in patients with diabetes mellitus type I,

but less impaired than in patients with asthma, irritable bowel syndrome and rheumatoid arthritis (28). Therefore, the effect of an intervention in food allergy may be best evaluated by using both generic and disease-specific HRQL questionnaires, as the FAQLQs may be more sensitive to detect disease-specific clinically important impairments in HRQL or HRQL differences over time, whereas generic HRQL questionnaires allow for comparison between different diseases, which may be relevant in comparative economic analysis (29).

In conclusion, the very high ceiling effects that were found for some generic scales may indicate that generic HRQL questionnaires are not sufficiently responsive in food allergy to measure disease-specific but potentially clinically important impairments in HRQL or HRQL differences over time. This finding was further supported by the low agreement between the generic and disease-specific questionnaires to identify food allergic patients with the best or worst HRQL, as well as the higher explained variance in HRQL by characteristics of food allergic patients in the disease-specific questionnaires than in the generic scales. Therefore, for measuring disease-specific clinically important impairments in HRQL or HRQL differences over time in food allergic patients, it may be preferable to use disease-specific HRQL questionnaires. However, generic HRQL questionnaires are indispensable for the comparison between different diseases and are thus complementary.

Acknowledgments

This work was funded by the EU through the EuroPrevall project (FOOD-CT-2005-514000).

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