

Child behaviour problems and childhood illness: development of the Eczema Behaviour Checklist

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Abstract

Background/Objectives Children with atopic dermatitis are at increased risk of both general behaviour problems, and those specific to the condition and its treatment. This can hamper the ability of parents to carry out treatment and manage the condition effectively. To date, there is no published instrument available to assess child behaviour difficulties in the context of atopic dermatitis management. Our aim was to develop a reliable and valid instrument to assess atopic dermatitis-specific child behaviour problems, and parents' self-efficacy (confidence) for managing these behaviours.

Methods The *Eczema Behaviour Checklist* (EBC) was developed as a 25-item questionnaire to measure (i) extent of behaviour problems (EBC Extent scale), and (ii) parents' self-efficacy for managing behaviour problems (EBC Confidence scale), in the context of child atopic dermatitis management. A community-based sample of 292 parents completed the EBC, measures of general behaviour difficulties, self-efficacy with atopic dermatitis management and use of dysfunctional parenting strategies.

Results There was satisfactory internal consistency and construct validity for EBC Extent and Confidence scales. There was a negative correlation between atopic dermatitis-specific behaviour problems and parents' self-efficacy for dealing with behaviours ($r = -.53$, $p < .001$). Factor analyses revealed a three-factor structure for both scales: (i) treatment-related behaviours; (ii) symptom-related behaviours; and (iii) behaviours related to impact of the illness. Variation in parents' self-efficacy for managing their child's atopic dermatitis was explained by intensity of illness-specific child behaviour problems and parents' self-efficacy for dealing with the behaviours.

Conclusions The new measure of atopic dermatitis-specific child behaviour problems was a stronger predictor of parents' self-efficacy for managing their child's condition than was the measure of general child behaviour difficulties. Results provide preliminary evidence of reliability and validity of the EBC, which has potential for use in clinical and research settings, and warrant further psychometric evaluation.

Keywords

atopic dermatitis, child behaviour, parenting, chronic disease, self-efficacy

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Introduction

Atopic dermatitis is one of the most common health problems of childhood, affecting 17.5% of children globally, and prevalence continues to increase worldwide (Williams *et al.* 2008). Onset is typically in early childhood, with 60 to 70% of affected

individuals developing atopic dermatitis in the first year of life (Ben-Gashir, Seed, & Hay, 2004; Kay, Gawkrödger, Mortimer, & Jaron, 1994), and 70 to 95% of cases symptomatic by age five (Krafchik, Halbert, Yamamoto, & Sasaki, 2003).

Optimal management of atopic dermatitis requires a complex, expensive and time-consuming daily routine of

moisturizers, emollient baths, topical corticosteroids, oral medications and allergen avoidance, and this is particularly so for children with moderate or severe disease (National Collaborating Centre for Women's and Children's Health's 2007). Adherence to treatment presents the biggest challenge to successful management (Chisolm *et al.* 2009). Even when cost of treatment is removed from the equation, adherence rates are reported to be only 32% (Krejci-Manwaring *et al.* 2007).

Involvement of parents and caregivers is crucial to successful atopic dermatitis management (Ersser *et al.* 2007). One factor likely to impair parents' ability to implement treatment plans, thereby influencing adherence and impacting child health, is child behaviour (Burgess *et al.* 2008; Gerson *et al.* 2004; Morawska *et al.* 2008). In an Australian study, 66% of parents reported that their child was sometimes or always uncooperative with their atopic dermatitis treatment (Fischer 1996). The child's dislike of bathing, application of topical medications and administration of oral medications can make treatment distressing for child and parent (Chamlin *et al.* 2004; Elliott & Luker 1997), and children who refuse to cooperate or follow their parents' instructions can make following treatment recommendations particularly difficult for parents (LeBovidge *et al.* 2007).

In addition to behavioural concerns specific to management, children with atopic dermatitis are at increased risk of general behavioural problems compared with healthy peers (Dennis *et al.* 2006; Schmitt *et al.* 2009), and more profound behavioural difficulties are associated with greater disease severity (Absolon *et al.* 1997; Daud *et al.* 1993), lower parent self-efficacy for managing atopic dermatitis and poorer performance of atopic dermatitis management tasks by parents (Mitchell *et al.* 2015). Parents of children with atopic dermatitis do report feelings of distress and incompetence in relation to parenting their child, particularly with managing problem behaviours (Daud *et al.* 1993; Faught *et al.* 2007), and may be reluctant to discipline their child in an attempt to avoid conflict (Daud *et al.* 1993). Parenting confidence and use of appropriate parenting strategies are therefore important for parents of children with atopic dermatitis. However, there is a paucity of literature examining parents' confidence with managing behaviour problems specific to atopic dermatitis. Measures used in previous research typically assess general child behaviour, providing little indication of which particular behaviours are most problematic in the atopic dermatitis management context (Morawska *et al.* 2008).

We sought to develop a reliable and valid measure of atopic dermatitis-specific child behaviour. Such a resource has

potential to inform development and evaluation of interventions targeting behaviour problems in children with atopic dermatitis. We aimed to (i) evaluate measurement of child behaviour problems and parents' self-efficacy for managing child behaviour problems in the context of childhood atopic dermatitis, using the newly developed Eczema Behaviour Checklist (EBC); (ii) identify behaviours presenting greatest difficulty to parents; and (iii) explore relationships between atopic dermatitis-specific behaviour problems and parents' self-efficacy for dealing with those behaviours.

Methods

Instrument development

The EBC is a self-administered questionnaire developed to assess parent-reported child behaviour problems, and parents' self-efficacy for dealing with child behaviour problems, in the context of child atopic dermatitis management. Items were generated via review of available literature examining management of childhood atopic dermatitis and characteristics of children with atopic dermatitis. Respondents use a 7-point Likert scale to indicate to what extent each behaviour has been a problem over the past four weeks (Extent scale) from 1 (*not at all*) to 7 (*very much*), and a 10-point Likert scale to rate their self-efficacy for dealing with each behaviour (Confidence scale) from 1 (*certain I can't do it*) to 10 (*certain I can do it*). Respondents may identify and rate two additional behaviours they find difficult to manage.

The EBC underwent pilot-testing with six parents of children with atopic dermatitis recruited from dermatology clinics of a tertiary hospital in Sydney, Australia. Parents completed the EBC independently, and evaluated (i) clarity and readability of instructions, items and rating scales, and (ii) relevance of items against their experience with their child. Two new items were included based on parent suggestions. Minor rewording made descriptions more explicit, and overall clarity of items and instructions was achieved. After further testing with six more parents, another new item was included, and one ('Uses eczema to avoid tasks or activities'), considered irrelevant by parents, was removed. A medical student administered the instrument to 10 more parents, and feedback confirmed face validity.

The final version comprises 25 items. Item scores are summed to generate Extent (25–175) and Confidence (25–250) scores. Higher scores indicate greater atopic dermatitis-specific behaviour problems, and greater self-efficacy for dealing with behaviours.

Participants

Study information was distributed to schools Australia-wide for inclusion in newsletters in May 2011. Eligible parents were directed to complete an anonymous online questionnaire. Approval to conduct the study was obtained from the University Ethics Review Committee. Inclusion criteria were that parents (i) had a child aged 3–10 years with a medical diagnosis of atopic dermatitis as reported by the parent; and (ii) were able to read and understand English.

Questionnaire measures

The *Eyberg Child Behaviour Inventory* (ECBI – 36 items) assesses parent-reported child behaviour difficulties (Eyberg & Pincus 1999). It yields an Intensity score (frequency of problem behaviours) and Problem score (number of problem behaviours). There was good internal consistency ($\alpha = .94$ and $.93$) for the present sample.

The *Child Adjustment and Parent Efficacy Scale* (CAPES – 30 items) assesses parent-reported child emotional and behavioural problems, and parents' self-efficacy for successfully dealing with them (Morawska *et al.* 2014). The Emotional Adjustment scale (four items) was used. Internal consistency was $\alpha = .63$ for the present sample.

The 25-item modified *Parental Self-Efficacy with Eczema Care Index* (PASECI), one of three scales that constitute the *Child Eczema Management Questionnaire* (Mitchell & Fraser 2011), assesses parents' self-efficacy for performing key atopic dermatitis management tasks (e.g. 'Help your child to get involved in managing their eczema'). Internal consistency was excellent for the present sample ($\alpha = .96$).

The *Parenting Scale* (PS – 30 items) assesses dysfunctional discipline styles (Arnold *et al.* 1993). Higher scores indicate use of less effective parenting strategies. The PS demonstrated good internal consistency for the total score ($\alpha = .89$).

The *Family Background Questionnaire* (FBQ) was used to collect demographics and information about child health and development problems.

Data analyses

EBC internal consistency was estimated using Cronbach's α and mean inter-item correlations. Cronbach's α of $.7$ – $.8$ were considered satisfactory (Bland & Altman 1997), and mean inter-item correlations of $.2$ – $.4$ indicate adequate homogeneity and limited redundancy (Briggs & Cheek 1986). Item analysis was conducted to check for incongruence or redundancy of

items, and to screen for floor and ceiling effects. Exploratory factor analysis using PCA was conducted to evaluate the internal structure of the EBC. To determine the number of factors to best represent interrelations among variables, we used (i) Kaiser's criterion (eigenvalues >1.0); (ii) Catell's scree test; and (iii) Horn's parallel analysis. Construct validity was assessed by examining correlations between (i) EBC Extent (atopic dermatitis-specific behaviour) and ECBI Intensity (general behaviour) scores, and (ii) EBC Confidence and PASECI scores. Finally, hierarchical multiple regression examined the ability of EBC Extent and Confidence scores to explain variation in parents' self-efficacy for managing atopic dermatitis. Participants with missing data (14.0%, 41) were excluded from analysis. Less than 4% of data was missing, and the pattern was completely random. Significance level was $p < .05$.

Results

Participants

Of 391 responses received from May 2011 to May 2012, 292 met inclusion criteria. Participant characteristics are presented in Table 1.

Internal consistency

Internal consistency for EBC Extent ($\alpha = .96$) and Confidence ($\alpha = .98$) scales exceeded $.7$, and mean inter-item correlations were $r = .45$ and $r = .69$, respectively. Most inter-item correlations were $.2$ – $.8$. All corrected item-total correlations exceeded $.2$, although item-total correlations for four Extent items and 17 Confidence items exceeded $.8$ (maximum $r = .87$). Floor and ceiling effects were acceptable ($<20\%$) for all Confidence items, 22/25 Extent items and for the total scores, where 0.7% and 19.2% scored the lowest score and 0.3% and 0.7% scored the highest score for Extent and Confidence, respectively.

Factor analyses

For EBC Extent, five components had eigenvalues >1 . However, the screeplot and parallel analysis suggested a three-component solution, explaining 65.45% of variance. Oblimin rotation aided interpretation of factors (Table 2), which reflected problems with Eczema Treatment Behaviours (Factor 1), Eczema Symptoms Behaviours (Factor 2) and Eczema Impact Behaviours (Factor 3).

Table 1. Demographic characteristics of participants ($N = 292$)

Variables		<i>M (SD)</i>
Child's age (years) [†]		6.04 (2.06)
Parent's age (years)		37.46 (5.75)
		% (<i>n</i>)
Child's sex	Male	50.0 (146)
	Female	50.0 (146)
Comorbidities	Asthma	35.3 (103)
	Allergy/anaphylaxis	7.2 (21)
	Allergic rhinitis	1.4 (4)
Household	Original family (two parents)	89.0 (260)
	Sole parent family	8.2 (24)
	Step family	2.7 (8)
Place of residence [‡]	Major city	43.5 (127)
	Regional/remote area	56.5 (165)
Parent's relationship to child	Mother	97.3 (284)
	Father	2.7 (8)
Parent's education	High school or less	23.3 (68)
	Trade/college	25.3 (74)
	University degree	28.8 (84)
	Postgraduate degree	22.6 (66)
Relationship status	Married/de facto	91.4 (267)
	Separated/divorced/single	8.6 (25)
Parent's employment	Full-time	18.6 (54)
	Part-time	45.7 (133)
	Job-seeking	4.8 (14)
	Working from home	6.5 (19)
	No paid employment	24.4 (71)
Able to meet essential expenses [§]	Yes	84.2 (245)
	No	14.8 (43)
	Don't know	1.0 (3)
After expenses can afford	Not much	16.8 (49)
	Some things	43.3 (126)
	Most things	39.9 (116)

[†] Range 3–10 years.[‡] Classified by home postcode using the Australian Standard Geographical Classification (ASGC) system.[§] Over past 12 months.

For EBC Confidence, three components had eigenvalues >1 . The screeplot and parallel analysis suggested three- and two-component solutions, explaining 77.22% and 82.71% of variance, respectively. Oblimin rotation revealed a clearer structure for the three-factor solution (Table 3). Factors were interpreted as for EBC Extent.

Atopic dermatitis-specific child behaviours

Behaviours were ranked from most to least problematic (Table 4). Mean scores were >3 for 12/25 items, indicating behaviours that were somewhat, much or very much of a problem. For those who listed additional behaviours, of

Table 2. Principal components analysis followed by oblimin rotation factor loadings for the Eczema Behaviour Checklist (EBC) Extent scale[†]

Item	Factor loadings		
	Factor 1	Factor 2	Factor 3
Factor 1: Eczema treatment behaviours ($\alpha = .96$)			
Refuses or resists having a bath or applying creams	0.96		
Argues about having a bath or applying creams	0.89		
Throws a tantrum about having a bath or applying creams	0.89		
Behaves disruptively when bathing or applying creams	0.88		
Tries to remove creams after application	0.84		
Complains about having creams applied	0.83		
Refuses to apply creams when eczema flares up	0.76		
Complains about the 'feel' of baths or creams	0.76		
Complains that baths or creams 'sting'	0.65		
Complains about having a bath	0.49		
Factor 2: Eczema symptoms behaviours ($\alpha = .94$)			
Complains about wanting to scratch		−0.94	
Complains about being itchy		−0.94	
Complains about eczema symptoms		−0.91	
Whinges or whines about eczema		−0.83	
Complains about eczema		−0.82	
Damages their skin further by scratching		−0.68	
Has trouble settling at bedtime or overnight		−0.64	
Factor 3: Eczema impact behaviours ($\alpha = .81$)			
Frequently comes home from school			0.78
Frequently visits the nurse at school			0.77
Refuses to participate in activities			0.73
Refuses to go to school			0.61
Applies creams incorrectly			0.53
Forgets to apply their creams			0.47
Becomes concerned or anxious when eczema flares up		0.33	0.44
Complains about going to the doctor	0.33		0.35
Eigenvalues and total variance (%) by factors			
Eigenvalues	12.23	2.22	1.92
Percentage variance explained (%)	48.92	8.86	7.67
Total percentage variance explained by factor model (%)			65.45

Note: Loadings <0.30 omitted from table; figures in italics indicate dual loadings. Items loading $\geq .30$ on more than one factor were allocated to the factor with the strongest loading.

[†] Pattern matrix.

greatest concern were (i) problems associated with impact of disease (e.g. 'Irrational when flared', 'Refuses to wear short sleeves/pants in the heat of summer in case people look at her'), followed by (ii) lack of cooperation with management strategies, and (iii) scratching behaviours.

Table 3. Principal components analysis followed by oblimin rotation factor loadings for the Eczema Behaviour Checklist (EBC) Confidence scale[†]

Factor loadings			
Item	Factor 1	Factor 2	Factor 3
Factor 1: Eczema treatment behaviours ($\alpha = .98$)			
Argues about having a bath or applying creams	1.00		
Complains about having creams applied	0.96		
Refuses or resists having a bath or applying creams	0.95		
Complains about the 'feel' of baths or creams	0.93		
Complains that baths or creams 'sting'	0.91		
Behaves disruptively when bathing or applying creams	0.89		
Throws a tantrum about having a bath or applying creams	0.87		
Tries to remove creams after application	0.75		
Refuses to apply creams when eczema flares up	0.71		
Complains about having a bath	0.70		
Forgets to apply their creams	0.44		
Factor 2: Eczema symptoms behaviours ($\alpha = 0.96$)			
Complains about being itchy		0.97	
Complains about wanting to scratch		0.93	
Damages their skin further by scratching		0.91	
Whinges or whines about eczema		0.83	
Complains about eczema symptoms		0.82	
Has trouble settling at bedtime or overnight		0.79	
Complains about eczema		0.68	
Factor 3: Eczema impact behaviours ($\alpha = 0.96$)			
Frequently visits the nurse at school			0.95
Frequently comes home from school			0.94
Refuses to go to school			0.87
Refuses to participate in activities			0.77
Complains about going to the doctor			0.70
Becomes concerned or anxious when eczema flares up			0.55
Applies creams incorrectly		0.33	0.46
Eigenvalues and total variance (%) by factors			
Eigenvalues	17.54	1.77	1.37
Percentage variance explained (%)	70.15	7.08	5.49
Total percentage variance explained by factor model (%)			82.71

Note: Loadings <0.30 omitted from table; figures in italics indicate dual loadings. Items loading $\geq .30$ on more than one factor were allocated to the factor with the strongest loading.

[†] Pattern matrix.

Construct validity

Correlations among variables are presented in Table 5. Notably, there were positive correlations between (i) atopic dermatitis-specific behaviour problems (EBC Extent) and general

Table 4. Eczema Behaviour Checklist (EBC) items ranked by mean score for Extent of the problem ($N = 292$)

Item	EBC Extent M (SD)	EBC Confidence M (SD)
Damages their skin further by scratching	4.77 (2.05)	6.96 (2.94)
Complains about being itchy	4.66 (1.90)	7.66 (2.53)
Complains about wanting to scratch	4.35 (2.16)	7.59 (2.56)
Complains that baths or creams 'sting'	3.92 (2.13)	8.09 (2.38)
Complains about having creams applied	3.68 (2.15)	8.43 (2.23)
Complains about eczema	3.57 (2.06)	8.08 (2.35)
Complains about eczema symptoms	3.57 (2.10)	7.97 (2.40)
Complains about the 'feel' of baths or creams	3.48 (2.24)	8.39 (2.29)
Has trouble settling at bedtime or overnight	3.48 (2.17)	7.63 (2.62)
Argues about having a bath or applying creams	3.42 (2.19)	8.32 (2.23)
Whinges or whines about eczema	3.35 (2.17)	7.88 (2.49)
Forgets to apply their creams	3.29 (2.01)	8.02 (2.43)
Refuses or resists having a bath or applying creams	2.89 (2.08)	8.29 (2.31)
Behaves disruptively when bathing or applying creams	2.89 (2.10)	8.27 (2.31)
Complains about having a bath	2.72 (2.02)	8.67 (2.09)
Becomes concerned or anxious when eczema flares up	2.74 (1.92)	8.28 (2.39)
Refuses to apply creams when eczema flares up	2.47 (2.00)	8.35 (2.39)
Throws a tantrum about having a bath or applying creams	2.29 (1.95)	8.43 (2.34)
Tries to remove creams after application	2.16 (1.86)	8.37 (2.42)
Applies creams incorrectly	2.11 (1.62)	8.34 (2.41)
Complains about going to the doctor	1.99 (1.69)	8.78 (2.29)
Refuses to participate in activities	1.77 (1.46)	8.46 (2.49)
Refuses to go to school	1.58 (1.24)	8.69 (2.45)
Frequently visits the nurse at school	1.37 (1.11)	8.71 (2.50)
Frequently comes home from school	1.29 (0.98)	8.71 (2.50)
Mean item scores		
Factor 1 – Eczema treatment behaviours	2.99 (1.76)	8.34 (2.07)
Factor 2 – Eczema symptoms behaviours	4.01 (1.78)	7.69 (2.30)
Factor 3 – Eczema impact behaviours	2.02 (1.15)	8.57 (2.20)
All scale items	2.97 (1.33)	8.22 (2.01)
Total scale scores	74.13 (33.36)	205.55 (50.25)

behaviour difficulties (ECBI Intensity); and (ii) self-efficacy for dealing with atopic dermatitis-specific behaviour problems (EBC Confidence) and self-efficacy for managing atopic dermatitis (PASECI). A strong negative relationship between EBC Extent and Confidence scores indicated that more extensive behaviour problems were associated with lower self-efficacy for dealing with them. Relationships between (i) atopic dermatitis-specific behaviour problems and (ii) self-efficacy for dealing with the behaviours, and behavioural and emotional difficulties, self-efficacy for performing atopic dermatitis management tasks, and use of dysfunctional parenting strategies, provided further evidence of construct validity.

Table 5. Correlations between child and parent variables

	<i>M (SD)</i>	EBC Extent	EBC Confidence	ECBI Intensity	ECBI Problems	CAPES Emotional	PASECI Total	PS Total
EBC Extent	74.13 (33.36)	1.00						
EBC Confidence	205.55 (50.25)	-.53**	1.00					
ECBI Intensity	99.86 (30.93)	.36**	-.33**	1.00				
ECBI Problem	8.51 (7.79)	.26**	-.26**	.68**	1.00			
CAPES Emotional	2.76 (2.17)	.31**	-.22**	.38**	.38**	1.00		
PASECI Total	8.24 (1.53)	-.44**	.51**	-.28**	-.26**	-.17**	1.00	
PS Total	2.72 (0.63)	.32**	-.38**	.48**	.39**	.27**	-.35**	1.00

Note: Pearson's correlations, two-tailed.

EBC: Eczema Behaviour Checklist; ECBI: Eyberg Child Behaviour Inventory; CAPES: Child Adjustment and Parent Efficacy Scale; PASECI: Modified Parental Self-Efficacy with Eczema Care Index; PS: Parenting Scale.

* $p < .05$.

** $p < .01$.

Predicting parents' self-efficacy for managing atopic dermatitis

Hierarchical multiple regression assessed ability of EBC Extent and Confidence scores to explain variation in self-efficacy for managing atopic dermatitis (PASECI), over and above that explained by demographics (step 1) and general measures of child emotional and behavioural difficulties (step 2). There was no evidence of multicollinearity. No multivariate outliers were found.

After inclusion of demographic variables (step 1), addition of general behavioural (ECBI Intensity) and emotional (CAPES Emotional Adjustment) difficulties (step 2) contributed significantly to the model. However, addition of atopic dermatitis-specific behaviour problems and parents' self-efficacy for dealing with atopic dermatitis-specific behaviour problems at step 3 made the most significant contribution. atopic dermatitis-specific behaviour problems ($p = .002$) and parents' self-efficacy for managing atopic dermatitis-specific behaviour problems ($p < .001$) accounted for 2.5% and 8.5% of unique variance in parents' atopic dermatitis management self-efficacy, respectively, exceeding that explained by general behaviour difficulties, which was no longer a significant predictor after atopic dermatitis-specific variables were added (see Table 6).

Discussion

Previous research has been limited by use of general measures of child behaviour, and little is known about behaviours that pose greatest difficulty to parents in atopic dermatitis management. The present study represents one of the first attempts to quantitatively assess atopic dermatitis-specific child behaviour problems, and parent confidence in dealing with these behaviours.

Usefulness of parent-report measures in guiding treatment and referral in a model of integrated medical and psychological healthcare for children with atopic dermatitis has already been demonstrated (LeBovidge *et al.* 2007). Our evaluation revealed preliminary evidence that the EBC is a reliable and valid measure

Table 6. Hierarchical multiple regression predicting parents' self-efficacy for managing child atopic dermatitis (PASECI) ($n = 255$)

	β	95% CI for β	t	r	sr^2	ΔR^2 (adj)
Step 1 [†]						.067**
Parent age (years)	.18	.05, .31	2.65**	.11	.026	
Child age (years)	-.06	-.20, .06	-.90	.04	.003	
Parent's education	-.27	-.40, -.14	-4.08**	-.18	.061	
Disposable income	-.14	-.28, .03	-2.28*	-.10	.019	
Step 2 [‡]						.051**
Parent age (years)	.14	.01, .27	2.15*	.11	.016	
Child age (years)	-.07	-.21, .06	-.97	.04	.003	
Parent's education	-.23	-.36, -.11	-3.62**	-.18	.045	
Disposable income	-.10	-.24, .01	-1.59	-.10	.008	
ECBI Intensity	-.20	-.35, -.08	-3.02**	-.28	.031	
CAPES Emotional	-.08	-.21, .06	-1.15	-.18	.005	
Step 3 [§]						.183**
Parent age	.07	-.05, .19	1.22	.11	.004	
Child age	-.03	-.16, .08	-.42	.04	.000	
Parent's education	-.17	-.29, -.06	-3.00**	-.18	.025	
Disposable income	-.10	-.22, .00	-1.77	-.10	.009	
ECBI Intensity	-.06	-.19, .05	-1.00	-.28	.002	
CAPES Emotional	.01	-.11, .13	.08	-.18	.000	
EBC Extent	-.20	-.33, -.07	-3.06**	-.42	.026	
EBC Confidence	.35	.23, .47	5.54**	.50	.084	

ECBI, Eyberg Child Behaviour Inventory; CAPES, Child Adjustment and Parent Efficacy Scale; EBC, Eczema Behaviour Checklist; PASECI, Modified Parental Self-Efficacy with Eczema Care Index.

[†] R^2 (adjusted) = .067, $F(4,250) = 5.60$, $p < .001$.

[‡] R^2 (adjusted) = .118, $F_{\text{change}}(2,248) = 8.09$, $p < .001$.

[§] R^2 (adjusted) = .301, $F_{\text{change}}(2,246) = 33.64$, $p < .001$, $F(8,246) = 14.70$, $p < .001$.

* $p < .05$.

** $p < .01$.

of atopic dermatitis-specific child behaviour problems, and parents' confidence with managing difficult behaviours.

Factor analysis identified almost identical division of items across the three-factor solutions for Extent and Confidence scales. Of particular note was separation into different factors of (i) behaviours specifically relevant to the treatment context; and (ii) generally problematic behaviours related to the illness. Although the mean Extent score for Eczema Symptoms Behaviours exceeded that for Eczema Treatment Behaviours, the consequences of disruptive behaviour during treatment could be substantial, potentially limiting the parent's ability to implement the treatment plan effectively and indirectly impacting on disease severity. Thus, clinical relevance of even relatively low levels of treatment-related behaviour problems must not be underestimated.

Results confirm the importance of child behaviour to parents' confidence when managing their child's atopic dermatitis, and make a contribution toward identifying parents' needs for support and intervention to successfully manage behaviour problems in this clinical group, and thereby limit the impact of child behaviour on parents' implementation of treatment plans. Relationships between atopic dermatitis-specific behaviour problems, general child behaviour difficulties and use of dysfunctional parenting strategies support the recommendation that a broad approach to intervention, targeting both general and disease-specific behaviour difficulties and parenting problems, would be useful (Morawska *et al.* 2015). Notably, disease-specific child behaviour problems were better than general child behaviour difficulties at predicting variation in parents' self-efficacy for managing their child's atopic dermatitis. Results therefore support the inclusion of disease-specific measures of child behaviour and parenting confidence in future research with parents of children with chronic health conditions.

Limitations are acknowledged. Parents did self-select for participation, and atopic dermatitis severity in the cohort is unknown. As parents reported additional problems, particularly psychosocial difficulties stemming from the child's condition, the EBC might be improved by including these behaviours. Future evaluation of the EBC should aim for samples of known clinical severity to enable assessment of the relationship between atopic dermatitis severity and atopic dermatitis-specific behaviour problems, and to confirm the generalizability of the scale structures. Assessment of relationships between the EBC and directly observed parent and child behaviour is also needed to confirm the evidence of construct validity found in the present study. In future, longitudinal research will evaluate the sensitivity of the EBC to clinical

change and elucidate causal relationships between child behaviour, parenting variables and parent management of child atopic dermatitis.

Key messages

- Children with atopic dermatitis are at increased risk of experiencing emotional and behavioural difficulties.
- Where child behaviour problems and parenting difficulties exist, parents may have particular difficulty implementing the child's management plan. However, little is known about parents' confidence with managing child behaviour in the context of atopic dermatitis management.
- This study provides preliminary evidence of reliability and validity of the Eczema Behaviour Checklist, a newly developed scale to assess atopic dermatitis-specific child behaviour problems.
- The Eczema Behaviour Checklist comprises three factors: (i) treatment-related behaviours; (ii) symptom-related behaviours; and (iii) behaviours related to impact of the illness.
- A broad approach to intervention that targets both general and disease-specific child behaviour difficulties and parenting problems may be useful with this clinical group.

Conflict of interest

The Triple P – Positive Parenting Program is owned by The University of Queensland. The University, through its main technology transfer company, UniQuest Pty Ltd, has licensed Triple P International Pty Ltd to publish and disseminate the program worldwide. Royalties stemming from published Triple P resources are distributed in accordance with the University's intellectual property policy and flow to the Parenting and Family Support Centre, School of Psychology, Faculty of Health and Behavioural Sciences, and contributory authors. No author has any share or ownership in Triple P International Pty Ltd. Alina Morawska is an author of various Triple P resources. Amy Mitchell is a staff member employed at the Parenting and Family Support Centre.

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