Management of atopic dermatitis in children: Evaluation of parents' self-efficacy, outcome expectations, and self-reported task performance using the Child Eczema Management Questionnaire

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Abstract

Child behaviour management is crucial to successful treatment of atopic dermatitis (AD). This study tested relationships between parents' self-efficacy, outcome expectations, and self-reported task performance when caring for a child with AD. Using a cross-sectional study design, a community-based convenience sample of 120 parents participated in pilot-testing of the Child Eczema Management Questionnaire — a self-administered questionnaire which appraises parents' self-efficacy, outcome expectations, and self-reported task performance when managing AD. Overall, parents' self-reported confidence and success with performing routine management tasks was greater than that for managing their child's symptoms and behaviour. There was a positive relationship between time since diagnosis and self-reported performance of routine management tasks; however, success with managing the child's symptoms and behaviour did not improve with illness duration. Longer time since diagnosis was also associated with more positive outcome expectations of performing tasks that involved others in the child's care (that is, health care professionals, or the child themselves). This study provides the foundation for further research examining relationships between child, parent, and family psychosocial variables, parent management of AD, and child health outcomes. Improved understanding of these relationships will assist health care providers to better support parents and families caring for children with AD.

Keywords Child behaviour; chronic disease management; dermatitis, atopic; eczema; parenting; self-efficacy.

What is known about this topic

- Parents' self-efficacy for managing children's health treatments impacts child morbidity, but evaluation of parents' self-efficacy in the context of AD management is limited.

What this paper adds

- This paper provides important insights into the way in which parents of children with AD manage treatments and child behaviour problems. Parents in the study reported high levels of self-efficacy and success when performing routine AD management tasks. At the same time, they reported poorer self-efficacy and were less successful in managing their child's symptoms and behaviour. Chronicity of AD was associated with better confidence and success in performing routine management tasks, but not in managing the child's symptoms and behaviour. Results point to the potential importance of interventions to promote child behaviour and address parenting issues relevant to child AD management.

Declarations

Competing interests None.

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Introduction and background

Atopic dermatitis (AD), or "atopic eczema", affects 17.5% of children worldwide[1]. International Study of Asthma and Allergies in Childhood (ISAAC) data indicate that prevalence has increased steadily in many countries over the past decades, and prevalence in Australian and New Zealand children remains among the highest in the world[1,2]. Australia has experienced one of the steepest increases in prevalence of severe AD, with a 185% relative increase between 1993 and 2003[1].

Characterised by dry skin, intense pruritis, and a papular rash which becomes excoriated and lichenified, onset occurs by age one in 60% of cases[3], and 70% to 95% of affected individuals develop symptoms by age five[4]. Although presentation and distribution of lesions vary with age, the characteristically intense pruritis is the major cause of morbidity. Management strategies aim to control symptoms and prevent exacerbations, thereby reducing pruritis, minimising sleep disruption, and limiting the overall impact on child, parent and family[5].

Parents are instrumental to successful management in children. Unfortunately, the episodic and often unpredictable nature of AD can have a profoundly negative impact on the physical, psychological and social wellbeing of affected children and families[6]. Management can be time-consuming and costly, placing substantial financial burdens on families and the public health system[7], and poorly controlled disease increases the risk of infection of affected skin by bacterial or viral agents[8], contributing to the need for hospitalisation.

As may be expected, parents report a lack of confidence for managing AD[9]. This is not surprising, given the reported levels of emotional, psychosocial and behavioural difficulties experienced by children suffering a chronic illness generally[10-13]. Family environment, illness severity and chronicity of the disease rather than the specific illness place affected children at risk for adjustment disorders[14-16].

Management of AD may be made even more challenging by the child's lack of cooperation with management strategies, which can make providing treatment distressing for both child and parent[17]. This was the focus of previously reported research that indicated that not only infants[18,19], but also young children[20] and even older children[21-23] with AD were at increased risk of emotional and behavioural difficulties. Parents of children with AD were indeed found to be at higher risk of parenting stress, depression and anxiety[19,20,24]. Dysfunctional family patterns and strain on parental relationships are common[18,20,25]. Increased family stress is associated with greater disease severity[21,26], increased likelihood of disease onset[27] and reduced likelihood of disease resolution[28]. Dysfunctional family patterns can limit the family's problem-solving and coping ability, exacerbating family tensions and triggering emotional reactions in the child, which may exacerbate atopic disease[28]. Less supportive family environments and greater impact of AD on family functioning have also been associated with behaviour problems in affected children[21].

The concept of *self-efficacy* was first proposed by Bandura in 1977, and is a construct common to many health behaviour theories. In his seminal work, Bandura defined efficacy expectation as "the conviction that one can successfully execute the behaviour required to produce the outcomes"[29]. He proposed that, given adequate skills and incentives, an individual's reaction to obstacles and adversity in a given situation — the amount of effort they will apply, and their level of perseverance — will be determined by their self-efficacy beliefs[29]. Over past decades, relationships have been identified between psychosocial factors and variations in *parental self-efficacy* — a parent's perception of their own ability to perform tasks related to parenting their child[30]. Parents' perceptions of child behaviour problems[31,32] and difficult child temperament[33,34] are associated with lower parental self-efficacy, as are parental depression[33,35] and stress[31]. Conversely, social and marital support are associated with greater parental self-efficacy[33,36], and supportive marital relationships appear to bolster parental efficacy[37], reducing the impact of stressors[38]. Higher household income[31,34] and more years of formal education[34] are also associated with greater parenting self-efficacy. Bandura[37] suggests that self-efficacy mediates the impact of multiple-role demands on parents' wellbeing, although parents' psychological state may also feed back directly to their self-efficacy perceptions[39].

Most importantly, parental self-efficacy appears to mediate actual parenting behaviour. Greater self-efficacy is associated with more positive parent–child interactions[40], greater maternal competence[33,38], use of consistent discipline practices[41] and parental warmth[42]. Moreover, emerging research reveals that parents' self-efficacy predicts performance of management tasks when caring for a child with a chronic health condition: for example, asthma[43-46] and cystic fibrosis[47]. Furthermore, parents' self-efficacy for managing their child's condition has been associated with indicators of morbidity in children with asthma[48,49] and juvenile rheumatoid arthritis[50,51]. Likewise, *outcome expectations* — expectations that the performance of certain behaviours will lead to particular outcomes[52] — have been found to predict parents' performance of asthma management tasks[43-45] and asthma morbidity in children[48,53,54].

Despite the importance of these constructs to chronic disease management and health outcomes, self-efficacy, outcome expectations, and management behaviours of parents caring for children with AD remain virtually unexplored.

While interventions aiming to improve management of AD through psychological support and education of parents and caregivers are promising[55-58], evaluations of effectiveness have been hampered by lack of sensitive, parent-focused instruments to measure change[59]. The *Child Eczema Management Questionnaire* (CEMQ)[60] was developed as a measure of parents' self-efficacy beliefs, outcome expectations, and self-reported task performance in the context of child AD management. The preliminary psychometric evaluation of the CEMQ is reported elsewhere[60] (no identical material is included in this report). The current paper presents descriptive data from pilot-testing of the CEMQ, and provides a brief initial exploration of parents' beliefs and behaviours in the context of child AD management.

Methods

Sample and setting

The sample was recruited nationally from all states of Australia except Queensland, which was excluded to prevent contamination of the pool of potential participants for a related study. Notices were placed in school newsletters in February 2009 inviting eligible parents to participate by completing a questionnaire, either online or in a printed format. Respondents returned completed questionnaires during February and March 2009. Participants met the following inclusion criteria: (a) is a primary caregiver of a child with AD aged 12 years or under; (b) child has a medical diagnosis of AD as reported by the parent; and (c) gives informed consent to participate in the study.

Measures

The CEMQ[60] evaluates a parent's self-efficacy, outcome expectations, and self-reported task performance when managing their child's AD. It contains three scales: (i) the modified Parental Self-Efficacy with Eczema Care Index (PASECI); (ii) the Parent Eczema Management Scale (PEMS); and (iii) the Parent Outcome Expectations of Eczema Management Scale (POEEMS). Each contains 25 items representing key AD management tasks, and respondents rate each item using 11-point Likert scales. Total scores for scales and subscales are generated by summing scores from each item and dividing by the number of items, and range from 0 to 10. Higher scores indicate greater self-efficacy, more successful task performance, and more positive outcome expectations.

First, the modified PASECI, derived from the original version of the Parental Self-Efficacy with Eczema Care Index[61], was used to assess parents' self-efficacy for managing various aspects of their child's AD. Respondents rate their self-efficacy for performing each task from 0 (*cannot do at all*) to 10 (*highly certain can do*). PASECI has demonstrated satisfactory test-retest reliability (r=.82) and internal consistency (α=.89) for the total scale, as well as for subscales Performing Routine AD Management Tasks (α=.84) and Managing the Child's Symptoms and Behaviour (α=.85)[60].

Next, PEMS was used to assess parents' self-reported performance of AD management tasks. An indication of how often each task is successfully performed by the respondent is given by rating each from 0 (*never*) to 10 (*always*). PEMS has demonstrated satisfactory test-retest reliability (r=.88) and good internal consistency for subscales Performing Routine AD Management Tasks (α=.88) and Managing the Child's Symptoms and Behaviour (α=.83), and for the total scale (α=.90)[60].

Lastly, POEEMS was used to appraise parents' expectations that performing key management tasks would improve their child's AD. The scale contains three subscales: Managing AD Myself (α=.87), Involving Healthcare Professionals (α=.86) and Involving My Child (α=.84). Each task is rated from 0 (*not at all helpful*) to 10 (*always helpful*). POEEMS has demonstrated good test-retest reliability (r=.89) and internal consistency for the subscales and for the total scale (α=.91)[60].

Managing Personal Challenges when Caring for Your Child with Eczema is a subscale of the original version of PASECI, developed by Ersser *et al.*[61]. It contains 11 items that represent general obstacles to successful AD management, and is used to assess parents' self-efficacy for managing their child's AD under challenging circumstances: for example, during or after experiencing personal or family problems. For the purposes of this study an additional item was added: "When my child is uncooperative with his/her treatment". Respondents rate each item on an 11-point Likert scale response format anchored at 0 (*cannot do at all*) and 10 (*highly certain can do*), and item scores are averaged to provide a total score between 0 and 10. The subscale demonstrated good internal consistency (α=.93) and test-retest reliability (r=.92) in the present study.

Statistical analyses

Analyses were performed using SPSS 17.0. Descriptive statistics summarised sample characteristics. Frequency distributions of all variables were examined to determine distribution of data. Parametric tests were used for normally distributed data, and non-parametric tests were used for data that was not normally distributed. A significance level of .05 was used to indicate statistically significant associations.

Results

A total of 120 parents participated in the study. Sample characteristics are described in Table 1. All children (aged 1–12 years) had been formally diagnosed with AD by at least one medical practitioner (general practitioner, dermatologist, or immunologist) for one year or longer. A chi-square goodness-of-fit test confirmed representativeness of the sample. No significant difference was found for the distribution of children from metropolitan (63.3%), regional or remote (36.7%) areas compared with 2006 Australian Census population distribution data[62], χ^2 (1,n=120)=1.20, p=.273. The proportion of respondents from each participating state in Australia was also similar to the 2006 Australian population distribution[63], χ^2 (6,n=120)=8.46, p=.206. Most (94%, 113) chose to complete the online version of the questionnaire.

Parents' self-efficacy, task performance, and outcome expectations when managing AD

Average scores for items and scale totals are presented in Table 2. Parents reported lowest self-efficacy for managing scratching behaviour and managing to avoid irritants. These tasks were also among those parents reported performing least successfully, along with helping their child to get involved in managing their AD, getting their child to follow their management plan when reluctant, and telling the GP when they disagree with them. In contrast, parents scored their outcome expectations of the majority of management tasks quite highly (>8) on average, although they considered applying antibiotic cream was least likely to improve their child's AD.

For the PASECI subscales, the median score for Performing Routine Management Tasks (8.77, range 4.60–10.00) was higher than for Managing the Child's Symptoms and Behaviour (7.45, range 2.90–10.00). Similarly for PEMS, the median score for Performing Routine Management Tasks (7.81, range 1.63–10.00) was higher than for Managing the Child's Symptoms and Behaviour (6.94, range 2.33–10.00). These differences were significant for both PASECI (Wilcoxon Signed Rank Test, z=6.85, p<.001) and PEMS (z=3.73, p<.001). Thus, parents rated themselves as more confident and successful in performing tasks related to routine management, and less confident and successful in managing their child's symptoms and behaviour.

For the POEEMS subscales, the median score was highest for Involving My Child (9.00, range 0.00–10.00), followed by Managing AD Myself (8.50, range 2.79–10.00), and Involving Healthcare Professionals (8.39, range 1.44–10.00). Parents therefore rated tasks that involved the child participating in their own care as most likely to improve the child's AD, followed by those tasks parents performed independently. The subscale of tasks related to involving health care professionals in the child's management was rated least likely to improve the child's condition. A Friedman test revealed that differences across subscale scores for POEEMS were also statistically significant, χ^2 (2,n=120)=10.63, p=.005.

There were positive relationships between duration of AD and total scores for PEMS (r=.24, n=120, p=.008) and POEEMS (r=.23, n=120, p=.013). Longer duration was associated with more successful task performance, and more positive outcome expectations of performing management tasks. For PEMS, longer duration of AD was associated with greater self-reported success in Performing Routine Management Tasks (rho=.24, n=120, p=.007); however, there was no significant relationship between AD duration and success in Managing the Child's Symptoms and Behaviour (rho=.12, n=120, p=.210). For POEEMS, longer duration of AD was associated with more positive outcome expectations of both Involving Healthcare Professionals (rho=.19, n=120, p=.035) and Involving My Child (rho=.19, n=120, p=.035); however, there was no significant relationship between duration of AD and outcome expectations of Managing AD Myself (rho=.12, n=120, p=.210).

There was no significant relationship between AD duration and scores for PASECI (r=.15, n=120, p=.104); nor were there significant relationships between self-efficacy, task performance, or outcome expectations and the age of the parent or child, or gender of the child.

Table 1: Characteristics of study participants (N=120)

Variable	
Parent age (years)	37.86 (5.79)
Child age (years)	6.68 (2.94)
Parent gender % (no.)	
Male	5.0 (6)
Female	95.0 (114)
Child gender % (no.)	
Male	45.8 (55)
Female	54.2 (65)
Duration of child's AD (years)	5.72 (2.86)

Note. All figures are means (*SD*) unless stated otherwise.

Managing personal challenges when caring for a child with AD

The mean score for Managing Personal Challenges when Caring for Your Child with Eczema was 7.19 (*SD*=1.81). Median scores for all 11 items fell between 7 and 8 (potential range for subscale: 0–10). On average, parents reported feeling least confident in managing their child's AD: (i) when they were feeling ill themselves; (ii) when their child was uncooperative with his/her treatment; (iii) when it was difficult to get the prescribed creams; or (iv) when they themselves were feeling low or anxious (Table 3 and Figure 1).

Discussion

To facilitate development and evaluation of evidence-based, parent-focused interventions to improve management of childhood AD, reliable and valid instruments to appraise parents' self-efficacy, outcome expectations, and performance of AD management tasks are needed. This paper presents one of the first examinations of self-efficacy beliefs, outcome expectations, and self-reported performance of management tasks by parents caring for a child with AD. Together, the scales comprising the CEMQ provide the opportunity to examine all three key constructs of self-efficacy theory, as defined by Bandura, in the context of child AD management. This has been neglected by researchers to date, whose focus has been self-efficacy alone.

As previously reported[60], factor analysis of PASECI and PEMS revealed the presence of a common factor referring to management of symptoms and behaviour. Interestingly, parents reported greater self-efficacy and success when performing routine AD management tasks, and lower self-efficacy and less success when managing their child's symptoms and behaviour. Furthermore, longer duration of AD was associated with increased confidence and success in performing routine management tasks, but not in managing symptoms and behaviour. This is important considering the documented difficulties faced by this clinical group with regard to child behaviour problems, and parental stress,

Table 2: Average scores for PASECI, PEMS, and POEEMS items and total scores (N=120)

	PASECI	PEMS	POEEMS
Items			
1. Choose a moisturiser	9 (1–10)	8 (0–10)	9 (1–10)
2. Apply moisturisers	10 (1–10)	9 (0–10)	9 (0–10)
3. Apply antibiotic creams	10 (0–10)	8 (0–10)	8 (0–10)
4. Correctly use steroid creams	10 (0–10)	9 (0–10)	9 (0–10)
5. Apply dressings/bandages	10 (0–10)	8 (0–10)	9 (0–10)
6. Make right choice of treatment options if eczema becomes worse	8 (0–10)	8 (0–10)	9 (2–10)
7. Take appropriate action if you think eczema infected	9 (0–10)	9 (0–10)	10 (0–10)
8. Judge whether the treatments/medications work	9 (2–10)	9 (0–10)	9 (2–10)
9. Ask a GP if you want to change medications	10 (0–10)	8 (0–10)	9 (0–10)
10. Ask a specialist if you want to change medications	10 (0–10)	8 (0–10)	9 (0–10)
11. Manage your child's scratching behaviour	6 (0–10)	6 (0–10)	9 (0–10)
12. Help child to get involved in managing eczema	8 (0–10)	7 (0–10)	9 (0–10)
13. Get child to follow management plan when reluctant	8 (0–10)	7 (0–10)	9 (0–10)
14. Help child fit eczema into a normal lifestyle	8 (0–10)	8 (0–10)	9 (0–10)
15. Manage to avoid things that irritate/aggravate eczema	7 (0–10)	7 (0–10)	9 (0–10)
16. Adjust management plan to allow for changes in schedule	8 (0–10)	8 (0–10)	9 (0–10)
17. Control eczema so child can play like other children	9 (2–10)	8 (2–10)	10 (0–10)
18. Manage eczema so symptoms are under control	8 (0–10)	8 (0–10)	9 (0–10)
19. Reduce sleep disturbance	8 (0–10)	8 (0–10)	9 (0–10)
20. Get access to health care professional	9 (0–10)	8 (0–10)	9 (0–10)
21. Tell GP when eczema not getting better	10 (1–10)	9 (0–10)	10 (0–10)
22. Ask GP to explain when don't understand	10 (2–10)	9 (0–10)	10 (0–10)
23. Tell GP when disagree	8 (0–10)	7 (0–10)	9 (0–10)
24. Decide when to call in help from GP or nurse	10 (0–10)	9 (0–10)	9 (0–10)
25. Ask to see a specialist	10 (0–10)	9 (0–10)	10 (0–10)
			8.07 (1.48)
Scale total — mean (*SD*)	8.12 (1.19)	7.19 (1.81)	

Note. Figures represent median (min–max) unless stated otherwise. Range of scores for items and scale totals = 0–10. PASECI: Parental Self-Efficacy with Eczema Care Index; PEMS: Parent Eczema Management Scale; POEEMS: Parent Outcome Expectations of Eczema Management Scale.

anxiety, and depression. Within the literature, parents have reported feelings of distress or incompetence in relation to parenting children with AD, particularly with managing problem behaviours[20,24], and may be reluctant to discipline their child in an attempt to avoid conflict, or because they may "feel sorry" for them[20]. As previously described, there are relationships between child behaviour problems and difficulty with managing child chronic health conditions. Moreover, emerging research has identified a relationship between parents' self-efficacy for performing key asthma management tasks and self-efficacy for managing problem behaviours of children with asthma[64]. Overall, results suggest that greater attention needs to be paid to parents' needs for support in managing symptoms and behaviour related to AD.

Lack of agreement between parents and health care professionals regarding AD treatment and management goals is common[65], and contributes to non-adherence, sub-optimal management, and worse child health outcomes[66]. In the present study, parents rated tasks involving health care professionals (for example, "Tell the GP when you disagree with him/her") as least likely to improve their child's AD, and parents of more recently diagnosed children reported less positive expectations of involving health care professionals in AD management compared to parents who had been managing their child for longer. Caution should be exercised when interpreting these results due to relatively weak relationships between the variables; however, this is a potentially important finding considering the well-established relationship between outcome expectations and task performance[52]. On this basis, it is plausible that a parent who expects less positive outcomes from involving health care professionals in their child's care may be less likely to actively seek advice and assistance when problems arise.

Finally, parents reported that self-efficacy for managing AD was lowest when they were feeling anxious or low, or when their child was uncooperative with treatment. These findings are also significant considering the elevated rates of depression and child behaviour difficulties reported for this clinical group in current literature.

Overall, results from this study reveal the potential importance of child behaviour and parenting issues to child AD management, and confirm the need for a detailed exploration of relationships between child, parent, and family factors, and parents' self-efficacy, outcome expectations, performance of AD management tasks, and child health outcomes. In particular, attention should focus on the possible impact of child behaviour difficulties on parents' self-efficacy in the context of child AD management. Although parents reported lower confidence and less success with managing their child's symptoms and behaviour, little is known about parents' perceptions of the challenges to successful management posed by child behaviour difficulties. Future research should explore parents' perceptions of key behavioural issues that impact their self-efficacy and ability to successfully manage their child's condition. Moreover, efforts should be made to include direct observations of child behaviour and parent performance of AD management tasks to confirm the validity of PEMS, and enable assessment of relationships between parents' self-efficacy, outcome expectations, and observed behaviour in this context.

Table 3: "Managing Personal Challenges When Caring for Your Child with Eczema" items ranked by median score (N=120)

Item	Average score
When I am feeling ill	7 (0–10)
When my child is uncooperative with his/her treatment	7 (0–10)
When it's difficult to get the prescribed creams	7 (0–10)
When I am feeling low or anxious	7 (0–10)
During or after experiencing personal or family problems	8 (0–10)
When I am tired	8 (0–10)
When it's difficult to get the right clothes for my child	8 (0–10)
When I have other time commitments	8 (1–10)
When I am feeling under pressure from work	8 (0–10)
Without support from my family or friends	8 (0–10)
During a holiday	8 (1–10)
When I have too much housework/childcare to do at home	8 (1–10)
Note. Figures represent median (min–max). Possible range of scores for items = 0–10	

Limitations

While a relatively small convenience sample of respondents self-selected for participation in the study, and data on socio-economic status was not collected, the sample was representative on the basis of geographical spread. Further exploration of these constructs should aim to include samples of objectively assessed clinical severity and socio-economic diversity.

Conclusion and implications for clinical practice

These findings represent a brief preliminary exploration of beliefs and behaviours of parents caring for children with AD. As paediatric and child health nurses, it is imperative to consider the psychosocial context when caring for children with chronic health conditions, recognising situations which may impact on parents' confidence and/or ability to implement treatment plans and successfully manage their child's condition. The CEMQ has potential to be useful in clinical settings to assess strengths, limitations, and concerns of parents when managing their child's AD. Its use may facilitate discussion between families and the clinicians caring for them, and enable clinicians to plan interventions to target specific areas of concern to the parent: for example, applying topical medications correctly, managing child behaviour, or communicating with health care professionals. Moreover, the instrument has potential utility in evaluation of interventions targeting parents' self-efficacy, outcome expectations, and task performance when managing their child's AD. This study provides the foundation for further research examining relationships between child, parent, and family psychosocial variables, parent management of AD, and child health outcomes. Ultimately, greater understanding of relationships between these variables will assist health care providers to better support parents and families caring for children with AD.

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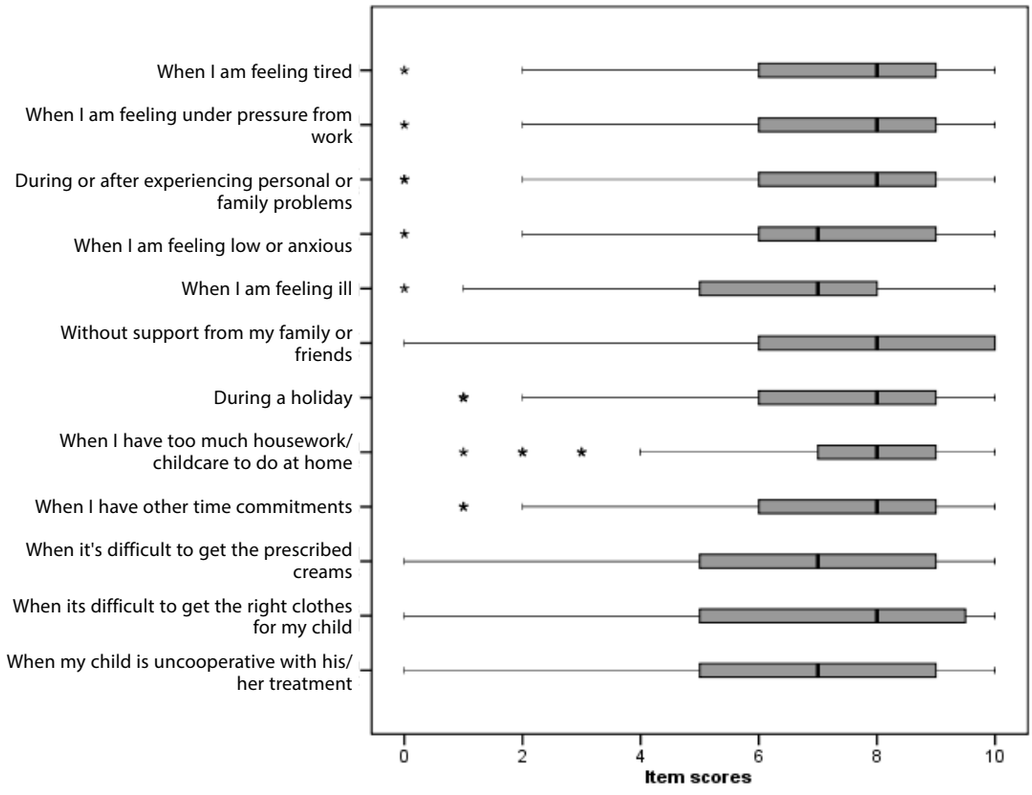

Figure 1: Box-and-whisker plot of responses to items: "Managing Personal Challenges When Caring for Your Child with Eczema" Note. Boxes represent interquartile range with median. Response scale: 0 = cannot do at all, 10 = certain can do.

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