

# A Review of the Effects of Psychological Interventions on the Quality of Life for Children with Atopic Dermatitis

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## **Abstract:**

Atopic Dermatitis (AD) is a psychologically debilitating disease due to its embarrassing skin lesions and pruritic nature which disturb the quality of life (QOL) of the patients. Even though children are primarily affected, caregivers can also be affected due to being the first line of care for others who are inflicted. This review focuses on randomized control trials which investigated the use of non-chemical forms of treatment to improve QOL and disease severity in children. A search of the PubMed database identified six studies that met the inclusion criteria. The studies were ranked from most rigorous trial to least. Various forms of education as an intervention were used. Conversely, the viewing of a humorous film was tested to examine if it had an impact on QOL. Education intervention versus no education at all showed that the intervention group had a larger decrease in disease severity than the control group. The form of education as a single consult with an AD educated nurse showed no difference between the control and the intervention group. Comparison of nurse-led clinics with the dermatologist-led clinics indicated that the nurse-led clinics were more successful. Viewing humorous films before bedtime was demonstrated as a successful means of reducing night-time awakenings. Also specific AD education versus routine education and consultations showed improvement in both groups. Finally, AD video-education versus direct parental teaching concluded that the video-education was more effective. Although the studies show that any form of education intervention is better than none, the methodological assessment of the studies showed that four of the studies were not rigorous enough or were not described at all. Further studies must be conducted in a more methodologically sound manner for the results to be considered replicable and valid.

## **Keywords:**

N/A

## Introduction

Atopic Dermatitis (AD) is a chronic, relapsing, and intensely pruritic skin disorder that frequently affects infants, children and young adults, but has been known to affect people of all ages. Also called eczema, it is a highly unpredictable disease composed of skin lesions of varying severity which typically precedes the development of asthma or other allergic rhinitis (Boguniewicz & Beltrani, 2002, p.165). The most common treatment takes the form of a topical corticosteroid ointment or cream, tar preparations, oral corticosteroids, anti-infection medications, and antixiolytics for severe nocturnal pruritis (Boguniewicz & Beltrani, 2002, p. 166). It is reported that the prevalence in adults of the presence of eczema for at least one year is at 1 to 3% and that 90% of cases begin before age five, of which most terminate at some point during childhood (Jones, Buchanan, & Burks, 2007, p. 218). Over the past three decades the disease has more than doubled ; a notable trend with ever more prevalent asthma, and increasingly severe allergies.

Boguniewicz *et al.* states that there is 10 to 20% prevalence of atopic dermatitis in children in industrialized nations. Even though the majority of the research on this topic has been carried out in the United Kingdom (Ben-Gashir, Seed, Hay, 2004, p. 285), where the incidence has been shown to be very high, it remains a disorder that also inflicts a large number of Canadians. In Hamilton and Saskatoon respondents representing children aged six to seven years and thirteen to fourteen years reported the prevalence of AD at 21.3% and 15.6%, respectively (Williams *et al.*, 1999, p. 127). While AD is a rather common disease appearing in many forms with many available treatments, yet the disease has no cure.

Despite the numerous years of research; AD has no unique skin lesions, or laboratory tests available to make a definite diagnosis. The disease is generally characterized by the features presented in Table I. Patients with AD have also shown an increased susceptibility to bacterial infections, thus further complicating their condition. Note that none of the above-mentioned descriptors can accurately describe what it feels to be a patient with AD. The psychological consequences of living with a skin disease are often undervalued. Moderate-to-severe AD can have a profound effect on the quality of life for both sufferers and their families. In addition to the effects of intractable itching, skin damage, soreness, sleep loss and the social stigma of a visible skin disease, other factors such as frequent visits to doc-

tors, special clothing and the constant application of messy topical ointments all add to the burden of disease (Hoare *et al.*, 2000, p. 5).

All this demonstrates that AD has a significant impact on children. The severe symptoms of AD put children into a state of psychological dysfunction where they experience feelings of loss of control, guilt and stigmatization or bullying, distorted body-image and self-esteem (Ben-Gashir, Seed, Hay, 2004, p. 284). This review addresses the question: how well do non-topical or non-oral treatments improve quality of life, and reduce disease severity in children with atopic dermatitis? The categories of non-oral or non-topical treatments included care-giver and patient education through various forms of media, and watching humorous films before bedtime.

## Methods and Materials

A search of the literature was conducted to locate research related to atopic dermatitis and eczema. Beginning with search terms such as *atopic dermatitis*, the search further specified into search terms such as: *infants, children, and adolescents with atopic dermatitis*. The population of interest was between ages 0 and 18 years and had to have a diagnosis of atopic dermatitis. The focus of this search was the limited to how quality of life is improved in children with AD through non-medicinal practices. Search strategy used was: *how does treatment improve quality of life for children with atopic dermatitis, SCORAD index, atopic eczema, child, nurse intervention, primary care, quality of life, randomized control trial, eczema severity, nurse-led clinics, and education intervention*. Most studies were found by using references from various articles which defined how quality of life was affected. Many types of study designs and methods were considered including randomized control trials, nonrandomized study designs, systematic reviews and meta-analyses.

The following databases were searched: Pub Med (MEDLINE), Scopus, Nursing and Allied Health Source, Psych Info, University of Ottawa Library Catalogue, and Google Scholar where links to articles were found which were then accessed through E-journals at the University of Ottawa website.

Studies that used non-conventional topical treatments such as aroma-therapy massage were excluded because they were involved in the relief of stress by chemical means

not through psychological or educational interventions. The study by Staab *et al.* (2002) was also excluded given that a more recent comprehensive study was explored instead.

## Criteria for Inclusion

The study had to be published in an internationally peer-reviewed journal and had to be described as randomized control trials. It had to be published within the last 10 years, 1999-2009, and had to be available in English, or a detailed review of it had to be available in English. Studies had to demonstrate how a non-topical and non-oral form of treatment, such as education through various forms of media improved quality of life in children with AD. They had to demonstrate how the treatment had an effect on the quality of life and/or disease severity in children aged from 0-18 years diagnosed with atopic dermatitis. Also the minimum number of participants in both the experimental group and the control group had to be 40. The studies were arranged from most number of participants, and therefore most robust and valid, to least number of participants. All studies were based on a care-giver and patient education approach. Although one study did not use a QOL index as listed, it did report improvement in reducing sleep disturbances which would have resulted in an increased QOL. Only randomized control trials could be considered the most rigorous form of assessment and were therefore included in this review.

Each study was assessed using a modified 0–5 scale (Jadad *et al.*, 1996, p. 7) which gave a point if the answer was yes to the study containing descriptions of randomization, withdrawals, and the method of blinding, up to a maximum score of 5. One point was deducted if methods for randomization or blinding were inappropriate. Modification of this scale was essential because, due to the nature of the psychological interventions it would be difficult to conduct double-blinded trials; therefore, in steps 2 and 5 above ‘double-blind’ was changed to ‘blind’ (Jadad *et al.*, 1996, p. 9).

## Results

In total fifteen studies met the search criteria. Six of these were chosen for review because they were the articles referenced by relevant review articles and also because they met

the inclusion criteria. The results of the studies that fit the inclusion criteria and how they rated on the scale may be viewed in Table II. Four of the studies observed education as an intervention, one of the studies investigated consultations with a primary care nurse, and the last study explored how watching humorous films improved night time awakenings.

Staab *et al.*, (2006) was the most rigorous study investigated; fulfilling all the criteria on the scale, especially adequate blinding and randomization. It aimed to determine the effects of age related structured educational programs on the management of moderate to severe atopic dermatitis in children and adolescent. The three participating groups were parents of children with AD aged 3 months to 7 years and 8-12 years and adolescents with AD aged 13-18 years and corresponding controls. Participants were recruited from seven centers in Germany. The inclusion criteria were: diagnosis of atopic dermatitis according to criteria as described in the study. 823 participants could be reached for evaluation: dropout rate of 17%. The study was designed as a randomized, controlled intervention study. The treatment program consisted of six, weekly group sessions. The primary end points were the differences in severity of eczema and parents' quality of life between the start of the study (baseline) and follow-up at 12 months. In this study the subjective severity score for eczema decreased significantly in the intervention groups, demonstrating that education as an intervention was effective.

In Chinn *et al.* (2002) children with eczema were recruited from two general practices into a randomized control trial over a twelve month period from Stockton-on-Tees, UK. The inclusion criteria were: 6 months to 16 years, and a diagnosis of atopic eczema. After filling out questionnaires that evaluated QOL, severity of AD, each child was randomized into the control or intervention group. The intervention involved demonstration of techniques for applying medication together with advice and education, delivered in a single session of 30 minutes by a trained dermatology nurse. A total of 119 intervention and 116 control children were recruited and followed up. There was an issue with obtaining complete data from all the children participating, and the description of withdrawals and drop-outs is rather poorly organized, as well there was no attempt at blinding. The data obtained for children who completed the whole process revealed no statistically significant improvements at 4 weeks or 12 weeks in the QOL of children with eczema as the result of the 30-min intervention.

The Moore *et al.* (2009) study was conducted in Melbourne, Australia with good blinding and randomization techniques. A total of 182 new referrals for the management of eczema were received and randomized to attend either the eczema workshop or the dermatologist-led clinic. A comprehensive diagram of participant flow is included in the study. Patients in the workshop had 90 minutes of contact time each with the nurse compared with an average of 40 minutes with the doctor in the dermatologist-led clinic. The criteria for inclusion in the study were infants, children and adolescents, aged 16 years or less, who were referrals from various professionals. The primary outcome was the severity of eczema of infants, children and adolescents, as measured using the SCORAD index 4 weeks after attending an eczema workshop or a dermatologist-led clinic for the management of eczema. A total of 99 patients participated in the study. At the 4-week review there was a significantly greater improvement in SCORAD in the patients of the eczema workshop. 73% of children improved to mild eczema after attending the eczema workshop compared with only 40% of children attending the dermatologist-led clinic.

Kimata (2007) presents a significantly different study design. In this study ghrelin levels associated with night-time awakening and stress measured during the night in AD patients, who tend to suffer from night-time awakenings due to pruritis. Ghrelin is involved in growth hormone secretion, regulation of appetite, anxiety, and night-time wakening (Kimata, 2007, p. 282). Salivary levels of ghrelin also correlate with plasma levels of ghrelin; therefore measuring salivary ghrelin levels is a useful non-invasive technique (Kimata, 2007, p. 282). After obtaining consent from parents, 40 male healthy children without AD and 40 male patients with moderate AD, graded on the SCORAD index, were studied. Since nocturnal ghrelin secretion is different between males and females the study was conducted separately for female children. All of the AD patients complained of night-time wakening prior to beginning of the study. The baseline study consisted of all participants viewing no film, and sleeping at the sleep laboratory in the hospital, and saliva was collected without stimulation periodically during the night. Randomly assigned 20 healthy children and 20 AD patients first viewed a humorous film before bedtime, and after 2 weeks, they viewed control non-humorous film and vice-versa. However the randomization strategy was not sufficiently described. Viewing the control film had no effect on night-time awakening in AD patients, while viewing the humorous film decreased night-time awakening in AD patients. The salivary

ghrelin levels reflect this; at 2:00 in the morning the salivary ghrelin levels were at 40 for the patients with AD when they watched the control film, and at baseline, but after they watched the humorous film, the levels dropped to 29. These results are very similar when conducted for female patients of the same age.

Grillo *et al.* (2006) aimed to measure outcomes of educational interventions including: subjective and objective measures of the severity of eczema and patient QOL. The study was designed as a randomized controlled trial to examine the impact of an educational intervention on QOL, family impact, and severity of paediatric AD. The study population comprised 61 paediatric patients diagnosed with AD and their parents. At baseline, both groups of participants were assessed by using the clinical SCORAD assessment tool, to determine the severity of their eczema. In addition all participants were given QOL and DFI questionnaires to complete. The intervention group undertook the education program through a 2-hour workshop, together with their normal management regimen. The control group received the standard care including routine education, medical consultation, and management. At week 4 and week 12 visits, both groups were assessed using the previously described tests. There was no attempt to conduct blinding even though it was possible to blind the outcome assessors. The difference in SCORAD scores at week 4 and week 12 was highly significant for both groups; nevertheless there was improvement in both groups.

The results from the Niebel *et al.* (2000) study were obtained from the Ersser *et al.* (2007) review because the original article was only accessible in German. It was a hospital-based randomized control trial with 47 participants. The intervention group attended multiple nurse-led eczema education workshops focusing on how parent and child can, as a team, self-manage the eczema. One was a video-based instruction and the other was direct parental instruction. The main outcome measures were disease severity in the child according to the SCORAD index. Still, the randomization strategy was poorly described, and there was no blinding. Base-line measurements were made before the beginning of the workshops. The study concluded that atopic eczema symptoms improved overall, but the effectiveness of the treatments differed significantly; most improvements were observed in the group provided with video assisted instruction compared to the group with direct parental teaching.

Therefore one can conclude that any form of AD education

is better than none at all. Despite two of the studies showing that there was no difference between the control and the intervention groups, other studies demonstrated that any form of educational intervention is helpful in reducing the severity of AD and improving the QOL of patients. The studies in this review showed a deficit in standard randomized control trial protocols as indicated by the Jadad *et al.* (1996) scale scores. As well there were a large number of QOL scales used indicating a need for standardization. SCORAD was effectively used in nearly all the studies.

Education as an intervention on its' own is complex as it can have a range of effects on the patient. The benefits may not be attributable solely to the educational interventions in comparison to the standard program or no educational program. In all the control groups it must be assumed that patients were highly motivated and tried to optimize their therapies. The only different study was observing how viewing humorous films affected night-time awakenings. It called for more studies to be conducted on the relationship between ghrelin and allergic diseases in order for future studies to confirm of their results. In general this method is a cost effective and efficient way of reducing restlessness of children with AD. There are significant opportunities to improve research design to evaluate psychological and educational interventions for children with AD and the reporting standards of such studies. Due to a large variety of educational interventions there is a need for more methodologically designed trials. These would employ intervention formats using validated outcomes measures, before any complete review is undertaken.

## Conclusion

This review indicated both strengths and weaknesses in the effectiveness of psychological intervention for children with AD. Although there are many methodological concerns in the articles reviewed, it is evident that AD is a psychologically debilitating disease causing a decrease in the quality of life for both the care-giver and the child, especially when the child is young. The findings of the review indicated that AD educational workshops are a slowly emerging form of treatment that has yet to be further researched in order to correctly assess their effectiveness.

Education as an intervention versus no education at all showed that the intervention group had a larger decrease in disease severity than the control group (Staab, 2006, p. 236). The form of education as a single consult with an AD

educated nurse showed no difference between the control and the intervention group (Chinn *et al.*, 2002, p. 437). Nurse-led clinics versus dermatologist-led clinics were tested (Moore *et al.*, 2009, p. 105), concluding that the nurse-led clinics were more successful. Viewing humorous films before bedtime was demonstrated as a successful means of reducing night-time awakenings (Kimata, 2007, p. 283). Also, both specific AD education and routine education and consultations showed improvement in both groups (Grillo *et al.*, 2006, p. 434). Finally AD video-education versus direct parental teaching concluded that the video-education was more effective (Niebel *et al.*, 2000, p. 401).

A key objective of the review was to ascertain if educational and psychological interventions can result in clinically significant changes in outcome for children with atopic dermatitis. There is insufficient evidence of the effectiveness of psychological interventions, as an addition to conventional topical therapy, to help manage children with AD. This is due to a lack of quality and quantity of data from individual studies and therefore an inability to undertake data synthesis subsequently (Ersser *et al.*, 2007, p. 4). There is a significant drive to undertake methodologically sound trials to evaluate theoretically based psychological interventions that may enhance the management of AD in children.

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## Appendix

**Table 1** Clinical Features of AD

<b>Major Features</b>	<b>Associated Features</b>
<ul style="list-style-type: none"> <li>• Pruritis</li> <li>• Chronic or relapsing course</li> <li>• Typical distribution: Facial and extensor involvement &lt;2 years old; Flexural involvement &gt;2years old</li> <li>• Personal and family history of atopy or allergic disorders</li> </ul>	<ul style="list-style-type: none"> <li>• Early age of onset</li> <li>• Course influenced by environmental and emotional factors</li> <li>• Itch with sweating</li> <li>• Intolerance to wools and other irritants</li> <li>• Xerosis</li> <li>• White dermatographism</li> <li>• Infraorbital darkening</li> <li>• Facial pallor or erythema</li> <li>• Hand or foot dermatitis</li> <li>• Hyperlinear palms</li> <li>• Frequent cutaneous infections, especially</li> <li>• <i>Staphylococcus aureus</i></li> </ul>

Adapted from Boguniewicz & Beltrani, 2002, p. 166

**Table 2** Selected Studies

<b>Study Details</b>	<b>Population Characteristics</b>	<b>Treatments, Interventions and Outcome measures</b>	<b>Results</b>	<b>Jadad Score (0-5)</b>
Staab, 2006	Parents and children with atopic dermatitis aged 3 months to 18 years (n=446) and controls (n=377)	Group sessions of standardized intervention programs for AD once weekly for six weeks or no education (control group). SCORAD and subjective severity (standardized questionnaires), and QOL for parents of affected children aged less than 13 years, were assessed over 12 months.	Significant improvements in severity of eczema and subjective severity were seen in all intervention groups compared with control groups.	5

**Table 2 continued:** Selected Studies

<b>Study Details</b>	<b>Population Characteristics</b>	<b>Treatments, Interventions and Outcome measures</b>	<b>Results</b>	<b>Jadad Score (0-5)</b>
Chinn, 2002	119 intervention and 116 control children aged 0.5-16 years.	Randomized control trial to evaluate the effects of a single consultation with a primary care nurse on the QOL of children with atopic eczema and the impact of the disease on their families. The (CDLQI), the (IDQOL) and the (FDI) were completed by the parent participants to judge QOL.	The scores on these measures were skewed at baseline, 20% of children had a zero score on the FDI, indicating no impact on family life. No significant improvements were found on the CDQOL and IDQOL measures between baseline, 4 and 12 weeks respectively ( $p>0.05$ ). There was a suggestion of marginal improvement in FDI score at 4 weeks in the intervention group.	3
Moore, 2009	99 patients referred to dermatology department of children's hospital diagnosed with AD, ages 16 or less	Randomized control trial where 49 caregivers of children with AD were selected to attend eczema educational workshop. The other 50 children participated in a standard dermatologist-led clinic. Patients underwent baseline assessment and followed-up 4 weeks after the intervention. The primary outcome was the severity of eczema.	At the 4-week review the mean improvement in SCORAD was significantly greater in those patients attending the eczema workshop than those attending the dermatologist-led clinic. The rest of the study compared how effective various treatments were in the two groups.	5
Kimata, 2007	40 male and 40 female patients; mean age 5 years without AD, and 40 male and 40 female patients, mean age 5 years with AD	Randomized control trial; Ghrelin is involved in night-time waking and stress which is associated with AD. Thus salivary ghrelin levels were measured for children with AD during the night; to observe effectiveness of watching humorous films before sleep. Males and females were in separate comparison groups because ghrelin secretion levels vary significantly.	Neither viewing non-humorous film nor viewing humorous film had any effect on healthy children (control group). In contrast, viewing humorous film improved night-time waking and reduced elevation of salivary ghrelin levels in patients with AD, while viewing control film failed to do so.	3
Grillo, 2006	61 paediatric patients (0-16 years), diagnosed with AD and their parents, excluding severe eczema	Randomized control trial where the participants were put into either the routine education control group or specific AD education group. Outcomes of educational interventions were measured over a 12 week period including: (a) subjective and objective measures of the severity of eczema and (b) patient QOL. Of secondary interest was any impact on the family.	Key findings demonstrated that education decreases the severity of eczema regardless which group the patient was in. QOL measures did not significantly improve with decreased severity of eczema	2
Niebel, 2000	47 mothers and their AD-children (mean age 4 years) participated in the study.	Does behaviour-based parental education in groups (DPE) or standardized video-education (VPE) enhance dermatological treatment effects and reduce skin-damaging behaviours in children and stress in their mothers. 18 mothers underwent the DPE (10 sessions), 15 mothers worked with VPE at home.	AD-symptoms improved overall, but parent education showed the most improvement with VPE rather than DPE. Psychological problems of mothers were equally reduced with DPE and VPE.	2