Psychological and Educational Interventions for Atopic Dermatitis in Adults: A Systematic Review and Meta-Analysis

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Psychological and educational interventions are valuable adjuncts in the management of adult atopic dermatitis. We performed a systematic review and meta-analysis of randomised controlled trials (RCTs) of the efficacy of these interventions. Twelve articles published between 1986 and 2013 were identified through electronic searches. The methodological quality was assessed according to the *Cochrane Handbook for Systematic Reviews of Interventions*, version 5.1.1 (Higgins & Green, 2015). A random-effects model was used to estimate the standardised mean difference (SMD). No significant difference was found in eczema severity determined in three RCTs (124 participants; SMD, -0.29; 95% CI [-0.64, 0.07]) and dropout rate in five RCTs (198 participants; relative risk, 0.66; 95% CI [0.20, 2.17]). Education via online video was significantly superior to handouts in ameliorating eczema severity in one RCT (80 participants). We conclude that, rather than a combination of these interventions with conventional therapy being of no value, the data did not have sufficient power to provide evidence-based conclusions.

■ *Keywords:* atopic dermatitis, meta-analysis, psychological and educational interventions, systematic review

Atopic dermatitis (AD) is a chronically relapsing skin disorder with a significant social and financial burden (Arkwright, Stafford, & Sharma, 2014; Bieber, 2008; Leung & Guttman-Yassky, 2014; Weidinger & Novak, 2015). AD commonly presents before the age of 5 years, with achievement of remission before adolescence in 70% of patients. However, severe cases may persist until adulthood. In addition, adult-onset AD differs in morphology and distribution of eruptions from childhood AD (Bannister & Freeman, 2000; Garmhausen et al., 2013; Ozkaya, 2005). It is currently estimated that 10–20% of children and 1–3% of adults in developed countries are affected by the disorder (Asher et al., 2006; Silverberg & Hanifin, 2013). The overall prevalence of AD has increased by two- to threefold over the last 3 decades in industrialised countries (Leung & Bieber, 2003; Odhiambo, Williams, Clayton, Robertson, & Asher, 2009).

Intractable itching, a hallmark of the disease, causes sleep disturbance and associated daytime tiredness, a lack of concentration, anxiety, depression, feelings of

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unattractiveness, and financial strain (Carroll et al., 2005; Garmhausen et al., 2013; Linnet & Jemec, 2001; Slattery et al., 2011). Stressful life events can aggravate skin symptoms through several possible mechanisms, such as alteration of pruritus perception and modulation of the immune response (Peters et al., 2014). Management of AD is thus complex and often requires a well-planned, multidisciplinary approach for optimal care to break the vicious cycle of itching and scratching (Arkwright et al., 2013; Schneider et al., 2012). In general, the choice of therapy depends on the severity of the eczema and the age of the patient, including identification and avoidance of exacerbating factors, skin hydration, and topical and systemic remedies. While topical corticosteroids and emollients are the first-line treatment for AD, these are not always effective. Furthermore, an unpleasant sensation from greasy ointment, steroid phobia related to fear of adverse effects, and repeated hospital visits lead to frustration, disappointment, and poor adherence to treatment (Charrman, Morris, & Williams, 2000). Thus, AD represents a major public health problem because of the significant morbidity, impaired quality of life (QOL), and healthcare costs.

Two previous meta-analyses (Chida, Steptoe, Hirakawa, Sudo, & Kubo, 2007; Ersser et al., 2014) suggested that psychological and educational interventions represented a critical option for successful management of childhood and adult AD. Because of differences in the course of disease and cognition between children and adults (Arkwright et al., 2014; Bieber, 2008; Friedman, Nessler, Cycowicz, & Horton, 2009; Leung & Guttman-Yassky, 2014; Weidinger & Novak, 2015), we assumed that the efficacy of these interventions in the management of AD should be verified separately. In this analysis, we extended our studies and aimed to systematically review randomised control trials (RCTs) to determine the effectiveness of psychological and educational interventions in addition to conventional treatment modalities in the management of adult AD.

Methods

We conducted a review of RCTs in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline (Moher, Liberati, Tetzlaff, Altman, & PRISMA Group, 2009). All of the objective, inclusion and exclusion criteria, primary and secondary outcomes, and methods of synthesis were prespecified. Approval from the Institutional Review Board was withheld as the data review had no direct subject involvement.

Inclusion Criteria

We included RCTs that compared psychological and educational interventions in addition to conventional treatment (intervention group) with conventional treatment only (control group) in AD patients aged 16 years or older irrespective of publication status, date, country, or language. In this review, conventional treatment was primarily pharmacotherapy. Quasi-randomised studies were excluded.

Interventions

The psychological interventions included supportive, cognitive, behavioural, and psychodynamic psychotherapies, cognitive-behavioural therapy, and physical training such as progressive muscle relaxation. Lectures, audiotapes, books, videotapes, and question-and-answer sessions for the educational interventions contained information on the disease, treatment options, and strategies for management and prevention. We

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considered simple provision of handouts as a component of conventional treatment. Both individual and group formats of the interventions were conducted. A trial in which psychological intervention followed educational intervention was classified as psychological, as the components of psychological interventions are often educational (Chida et al., 2007; Ersser et al., 2014). We included interventions of any duration and those remotely administered through telephone calls or video.

Outcome Measures

Primary outcomes were the severity of AD based on previously published named scoring systems, and the dropout rate defined as the proportion of patients who could not complete the required program for any reason. Secondary outcomes included QOL, anxiety, depression, sleep disturbance, use of medical resources such as topical corticosteroids and emollients, and financial cost.

Identification of Trials

We electronically searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, PsycINFO, Scopus, and CINAHL up to May 2014 with appropriate variations of the following terms: [atopic dermatitis; eczema; neurodermatitis; Besnier prurigo] (diagnosis or keyword) and [psychotherapy; behavior; behavior, cognitive; training; counseling; relaxation; program; education] (intervention). We also searched clinical trial databases such as the International Standard Randomized Controlled Trial Number, the U.S. National Institutes of Health ClinicalTrials.gov, and the World Health Organization International Clinical Trial Registry platform. A manual search of major dermatology and medical journals from reference lists of the articles was also conducted. No language restriction was imposed on the search. When necessary, the relevant authors were contacted to supplement any incomplete data in the original manuscript. Two authors (UO and KH) independently reviewed the titles and abstracts of the references retrieved from the searches and selected all potentially relevant trials. Disagreement in the trial selection was discussed with another author (NT) to reach consensus.

Data Extraction and Management

Using data extraction forms, as exemplified in Furukawa, McGuire, and Barbui (2002), two authors (UO and KH) extracted the following data from the original reports: the first author's last name, publication year, characteristics of the participants (sample size, age, sex, and baseline disease severity), characteristics of the interventions (type of intervention, number and length of session, and duration of follow-up), and outcome measurements.

Assessment of the Risk of Bias

The same authors (UO and KH) independently assessed the methodological quality of the selected trials based on the quality checklist recommended by the *Cochrane Handbook for Systematic Reviews of Interventions*, version 5.1.1 (Higgins & Green, 2015). The checklist contains six main sections, that is, sequence generation, allocation concealment, blinding, incomplete outcome data, selective outcome reporting, and other potential sources of bias. Any discrepancies were resolved by discussion among all authors.

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Measures of Treatment Effect, Data Synthesis, and Assessment of Heterogeneity

For dichotomous variables, the relative risk (RR) and 95% confidence interval (CI) were calculated using a random-effects model. For continuous variables, the standardised weighted mean difference (SMD) and 95% CI were calculated using a random-effects model (Furukawa, Guyatt, & Griffith, 2002). Data were entered into Review Manager 5.3 (http://www.cc-ims.net/RevMan) and double-checked for accuracy (Furukawa, Guyatt, & Griffith, 2002). Statistical heterogeneity among the trials was evaluated using the I^2 statistic and Q statistic (χ^2 test) for heterogeneity among the results of each outcome analysed. The significance level of the χ^2 test was set at 0.10.

Results

Study Selection

Figure 1 shows a flowchart of the search process. The electronic search conducted on May 19, 2014 identified 394 trials from CENTRAL, 231 from MEDLINE, 128 from PsycINFO, 2,027 from Scopus, and four from CINAHL. After looking over their titles and abstracts, we identified 67 articles as potentially relevant for inclusion in the review. Ten additional studies were identified through the clinical trial databases. Finally, a total of 12 trials (Armstrong et al., 2011; Bae et al., 2012; Bostoen et al., 2012; Guerra-Tapia et al., 2007; Habib & Morrissey, 1999; Jaspers et al., 2000; Linnet & Jemec, 2001; Melin et al., 1986; Norén & Melin, 1989; Schut et al., 2013; Shi et al., 2013; Van Os-Medendorp et al., 2012) satisfied the eligibility criteria (Table 1).

Study Characteristics

The included RCTs were published between 1986 and 2013 with sample sizes of 18–109 in studies with six educational interventions (Armstrong, Kim, Idriss, Larsen, & Lio, 2011; Bostoen, Bracke, De Keyser, & Lambert, 2012; Guerra-Tapia, Lleonart, & Balañá, 2007; Jaspers, Span, Molier, & Coenraads, 2000; Shi, Nanda, Lee, Armstrong, & Lio, 2013; Van Os-Medendorp et al., 2012) and sample sizes of 16–45 in studies with six psychological interventions (Bae et al., 2012; Habib & Morrissey, 1999; Linnet & Jemec, 2001; Melin, Frederiksen, Norén, & Swebilius, 1986; Norén & Melin, 1989; Schut et al., 2013). The age of participants ranged from 30 to 40 years, and severity of symptoms varied from mild to severe. All interventions were delivered in primary- and secondary-care settings except two RCTs with either population-based (Habib & Morrissey, 1999; Schut et al., 2013) or unclear (Bae et al., 2012; Guerra-Tapia et al., 2007) settings. The intervention formats were individual except three trials where interventions were given in a group (Jaspers et al., 2000; Bostoen et al., 2012; Shut et al., 2013). The length of the intervention varied from 3–5 minutes to 52 weeks, with two to six sessions in most RCTs. The follow-up duration after the interventions ranged from 1 day to 1 year, with a corresponding period in the control groups. The severity of AD was scored based on the SCORAD index (Bostoen et al., 2012; Jaspers et al., 2000; Linnet & Jemec, 2001; Schut et al., 2013), EASI (Bae et al., 2012; Bostoen et al., 2012), IGA (Guerra-Tapia et al., 2007; Shi et al., 2013), ADAM (Habib & Morrissey, 1999), POEM (Armstrong et al., 2011), the extent plus severity part of ISDL (Van Os-Medendorp et al., 2012), and an unnamed scoring system (Melin et al., 1986; Norén & Melin, 1989). Psychological interventions consisted of habit reversal

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TABLE 1

Characteristics of the Trials

Source (No. of participants)	Setting	Sample size: Intervention/ control	Intervention	Duration	No. of sessions	Follow-up	Outcome measure: Severity	QOL
Melin et al., 1986 (28)	Clinic based	7/9	Behavioural therapy. Individual. Habit reversal (behavioural habit-breaking method): patients were instructed to use the competing responses such as grasping objects when they felt an urge to scratch.	4 weeks	2	4 weeks	Physician's own evaluation	
Norén and Melin, 1989 (29)	Clinic based	23/22	Behavioural therapy. Individual. Habit reversal (behavioural habit-breaking method): patients were instructed to use the competing responses such as clenching their fists when they felt an urge to scratch.	4 weeks	2	4 weeks	Physician's own evaluation	

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TABLE 1

Continued

Source (No. of participants)	Setting	Sample size: Intervention/ control	Intervention	Duration	No. of sessions	Follow-up	Outcome measure: Severity	QOL		
Habib and Morrissey, 1999 (30)	Population based	9/8	Cognitive behavioural therapy. Individual. Program includes cognitive restructuring with reference to the itch-scratch cycle, self-consciousness, anxiety, and anger management.	6 weeks	6	14 weeks	ADAM		PANAS	PANAS
Jaspers et al., 2000 (31)	Hospital based	31/32	Educational therapy. Group. 6-hour sessions to inform patients about influencing factors, appropriate skin care, and to promote coping with AD, including stress management and self-control.	2 weeks	16	42 weeks	SCORAD	SF-36		

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TABLE 1

Continued

Source (No. of participants)	Setting	Sample size: Intervention/ control	Intervention	Duration	No. of sessions	Follow-up	Outcome measure: Severity	QOL	
Linnet and Jemec., 2001 (12)	Clinic based	16/16	Psychodynamic therapy. Individual. Method focused on illness-related conflicts involving perception of AD, disfigurement, anxiety and aggression related to itch-scratch patterns, and depressive feelings about living with a chronic illness.	26 weeks	15.5 (11–18)	52 weeks	SCORAD		STAI
Guerra-Tapia et al., 2007 (32)	Unclear	56/53	Educational therapy. Individual. Educational material contained information about everyday patient-oriented aspects of AD and a diary for recording itch and redness intensity using VAS.	26 weeks	3	26 weeks	IGA		STAI

TABLE 1

Continued

Source (No. of participants)	Setting	Sample size: Intervention/ control	Intervention	Duration	No. of sessions	Follow-up	Outcome measure: Severity	QOL			
Armstrong et al., 2011 (33)	Clinic based	40/40	Educational therapy. Individual. Online video education on the clinical manifestations of AD, contributing environmental factors, and abating techniques.	12 weeks	1*	12 weeks	POEM	VAS			
Bae et al., 2012 (34)	Unclear	15/10	Relaxation therapy. Individual. Progressive muscle relaxation using video and audio programs at home twice a day after procedures being supervised by a psychologist.	4 weeks	56	4 weeks	EASI		STAI	BDI	VAS

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TABLE 1

Continued

Source (No. of participants)	Setting	Sample size: Intervention/ control	Intervention	Duration	No. of sessions	Follow-up	Outcome measure: Severity	QOL	
Bostoen et al., 2012 (35)	Hospital based	10/11	Educational therapy. Group. 2-hour sessions containing education on AD, a healthy lifestyle such as diet, physical training, sleep hygiene and smoking.	13 weeks	24	39 weeks	SCORAD, EASI	DLQI, Skindex-29	BDI
Van Os-Medendorp et al., 2012 (36)	Clinic based	Unclear	Educational therapy. Individual Eczema portal consists of internet-guided monitoring, self-management training with general information about AD. Nurses could provide advices by e-consultation.	52 weeks		52 weeks	ISDL	DLQI	

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TABLE 1

Continued

Source (No. of participants)	Setting	Sample size: Intervention/ control	Intervention	Duration	No. of sessions	Follow-up	Outcome measure: Severity	QOL		
Schut et al., 2013 (37)	Population based	17/14	Cognitive behavioural therapy. Group. 3-hour session focused on cognitive restructuring and enhancing problem-solving strategies.	5 weeks	5	8 weeks	SCORAD		HADS	HADS
Shi et al., 2013 (38)	Clinic based	8/10	Educational therapy. Individual. Eczema Action Plan contained handout information on appropriate skin care method with an emphasis on controlling skin inflammation, moisturising and relieving itching.	3 to 5 minutes**	1	1 day	IGA		HADS	

Note: ADAM = Atopic Dermatitis Assessment Measure; DLQI = Dermatology Life Quality Index; EASI = Eczema Area and Severity Index; HADS = Hospital Anxiety and Depression Scale; IGA = Investigator's Global Assessment; ISDL = Impact of chronic skin disease on daily life; PANAS = Positive Affect, Negative Affect Scale; POEM = Patient-Oriented Eczema Measure; SCORAD = Severity scoring of atopic dermatitis; SF-36, Short form (36) health survey; STA = Spielberger's State-Trait Anxiety; VAS = Visual Analog Scale

*Online video available to participants to view more than once.; **Time for answering the questionnaire.

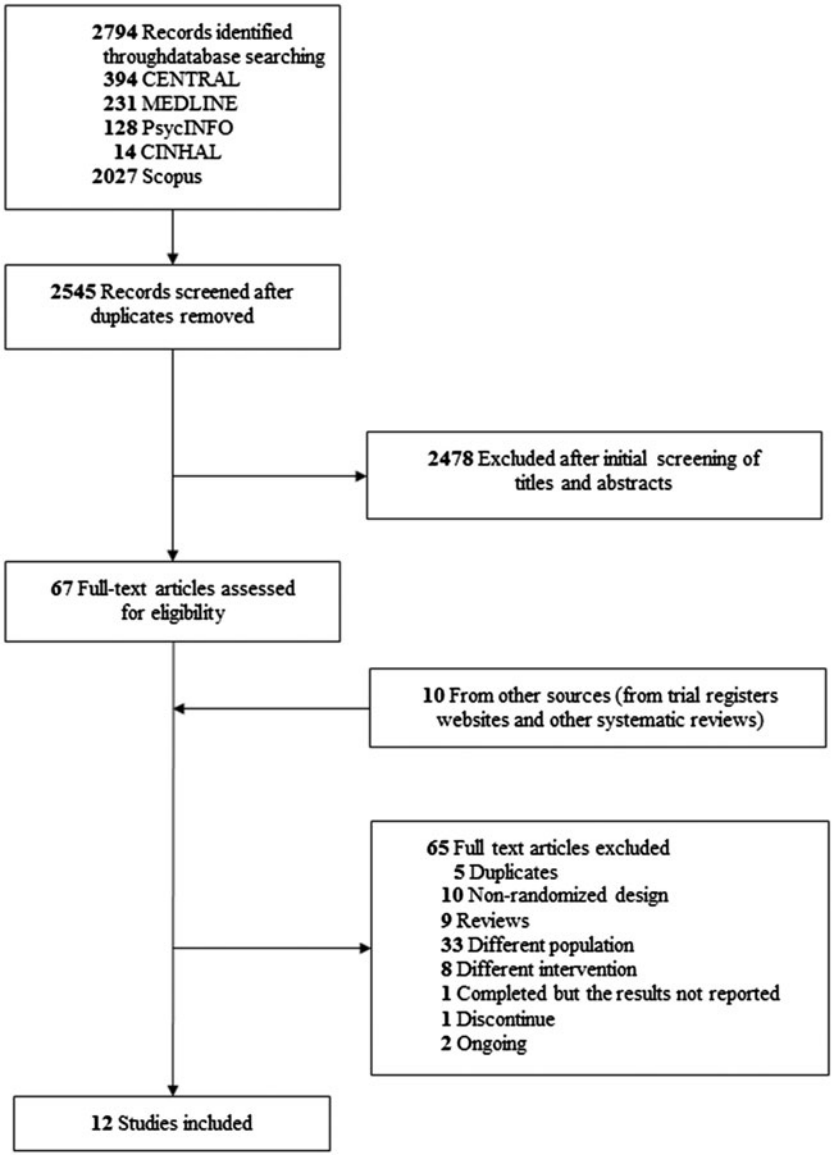


FIGURE 1

Flowchart of the literature search and study selection process.

(Melin et al., 1986; Norén & Melin, 1989), cognitive behaviour therapy (Habib & Morrissey, 1999; Schut et al., 2013), psychodynamic therapy (Linnet & Jemec, 2001), and progressive muscle relaxation (Bae et al., 2012). The interventions in six other studies (Armstrong et al., 2011; Bostoen et al., 2012; Guerra-Tapia et al., 2007; Jaspers et al., 2000; Shi et al., 2013; Van Os-Medendorp et al., 2012) were categorised as educational.

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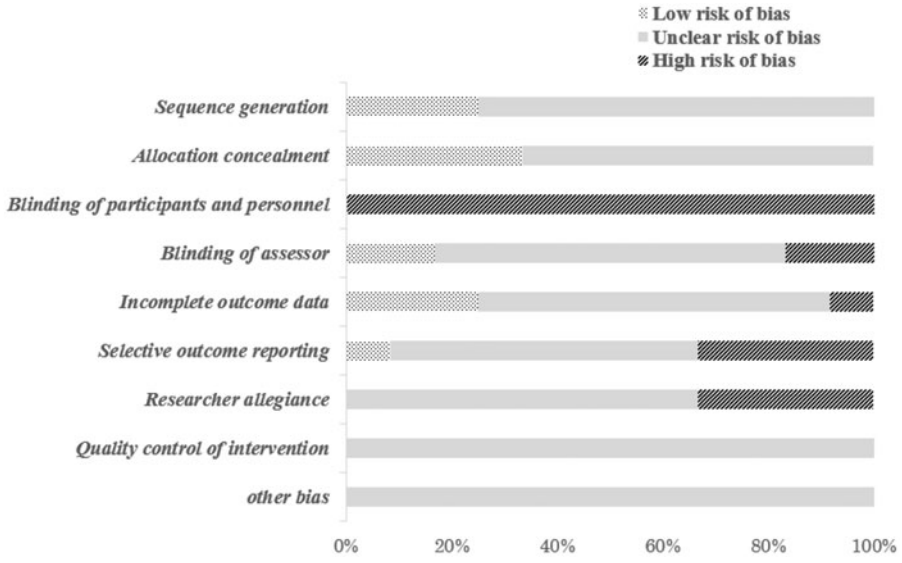


FIGURE 2

Risk of bias. Review authors' judgment of each trial is presented as percentage across all included trials.

Quality Assessment

Figure 2 shows the risk of bias, which indicates the quality of the included trials. Three of the trials (Armstrong et al., 2011; Bostoen et al., 2012; Van Os-Medendorp et al., 2012) had adequate sequence generation, and four (Armstrong et al., 2011; Bostoen et al., 2012; Van Os-Medendorp et al., 2012; Schut et al., 2013) concealed treatment allocation appropriately. Blinding of the assessor was adequate in two trials (Bostoen et al., 2012; Schut et al., 2013). Risk of bias was low for incomplete outcome data in three trials (Armstrong, 2011; Bae et al., 2012; Norén & Melin, 1989) and for selective outcome reporting in one trial (Van Os-Medendorp et al., 2012). Some RCTs had methodological weaknesses. Risk of bias was high for researchers' allegiance in four trials (Bostoen et al., 2012; Melin et al., 1986; Norén & Melin, 1989; Van Os-Medendorp et al., 2012). Blinding of participants and personnel was not possible in all 12 RCTs because of the nature of the psychological interventions. No studies reported quality control of psychotherapy regarding, for example, qualifications of the therapists and sessions.

Outcome Measurements

The follow-up duration was arbitrarily divided into <6 months and 6 months to 1 year, designated as short term and long term respectively. Of 11 RCTs that assessed the severity at short-term follow-up (Armstrong et al., 2011; Bae et al., 2012; Bostoen et al., 2012; Guerra-Tapia et al., 2007; Habib & Morrissey, 1999; Linnet & Jemec, 2001; Melin et al., 1986; Norén & Melin, 1989; Schut et al., 2013; Shi et al., 2013; Van Os-Medendorp et al., 2012), the intervention group

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showed better results compared with the control group in four trials (Armstrong et al., 2011; Habib & Morrissey, 1999; Melin et al., 1986; Norén & Melin, 1989). However, the eczema severity, when measured at long-term follow-up, did not significantly differ between intervention and control groups in five RCTs (Armstrong et al., 2011; Guerra-Tapia et al., 2007; Jaspers et al., 2000; Linnet & Jemec, 2001; Van Os-Medendorp et al., 2012). Five trials (Armstrong et al., 2011; Jaspers et al., 2000; Melin et al., 1986; Schut et al., 2013; Shi et al., 2013) disclosed the dropout rates, four at short-term follow-up and one at long-term follow-up, and ranged from 0 to 17.6% in the intervention group, and 0 to 12.5% in the control group.

Results of the secondary outcome measurements were as follows. QOL was comparable between two groups at short-term follow-up in four trials (Armstrong et al., 2011; Bostoen et al., 2012; Jaspers et al., 2000; Van Os-Medendorp et al., 2012). Anxiety was significantly reduced in the intervention group compared with the control group as assessed at short-term follow-up in two studies (Habib & Morrissey, 1999; Bae et al., 2012) and at long-term follow-up in three studies (Bae et al., 2012; Habib & Morrissey, 1999; Linnet & Jemec, 2001) of the six RCTs (Bae et al., 2012; Guerra-Tapia et al., 2007; Habib & Morrissey, 1999; Linnet & Jemec, 2001; Schut et al., 2013; Shi et al., 2013). Four trials (Bae et al., 2012; Bostoen et al., 2012; Habib & Morrissey, 1999; Schut et al., 2013) examined depression at short-term follow-up, with one trial (Bae et al., 2012) reporting significant alleviation only in the intervention group. Loss of sleep was significantly ameliorated in the intervention group at short-term follow-up in one trial (Bae et al., 2012). The intervention group used more emollients and less topical corticosteroids than the control group when examined at short- and long-term follow-up in one study (Jaspers et al., 2000). Another study reported a reduction in long-term costs in the intervention group because of fewer days of absenteeism from work compared with the control group (Van Os-Medendorp et al., 2012). However, cost-effectiveness was not apparent 6 months after the interventions when the program costs and use of medical resources were taken into account (Bostoen et al., 2012). Clinical heterogeneity could not be examined because of the paucity of the pooled data.

Meta-Analyses

When the data from three trials (Armstrong et al., 2011; Bae et al., 2012; Schut et al., 2013) were examined in a meta-analysis, the severity of AD at short-term follow-up did not differ between 65 participants in the intervention group and 59 participants in the control group (SMD = -0.29, 95% CI [-0.64, 0.07], I^2 = 0%; Figure 3). However, Armstrong et al. (2011) showed that education through online video (intervention), including clinical manifestations, contributing environmental factors, and bathing and handwashing techniques, was significantly superior to handouts (control) in improving the severity of AD. The dropout rate obtained from the data of five studies (Armstrong et al., 2011; Jaspers et al., 2000; Melin et al., 1986; Schut et al., 2013; Shi et al., 2013) was 5.82% in 103 participants in the intervention group and 8.42% in 95 participants in the control group, with no significant difference between the groups (RR = 0.66, 95% CI [0.20, 2.17], I^2 = 10%; Figure 4). These data suggested that there was no difference in the acceptability of the treatment between both groups. A meta-analysis of secondary outcomes was not possible because of limitations in the available data.

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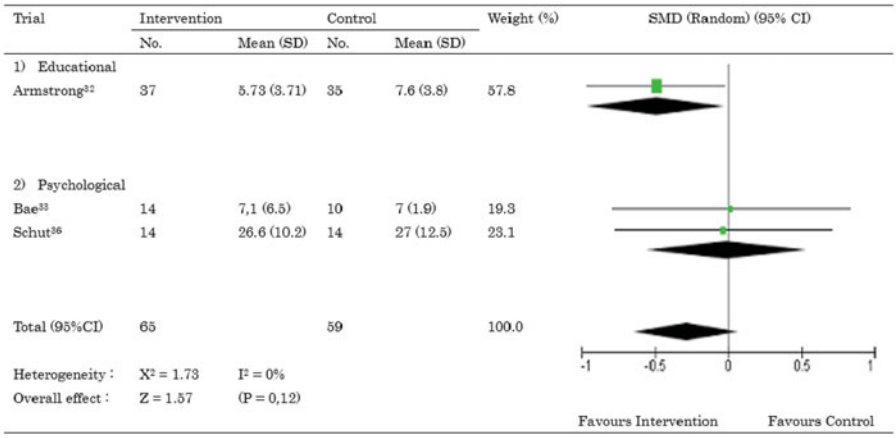


FIGURE 3

Forest plot of the severity scores for the intervention group versus control group. The square boxes indicate effect size and sample size (the larger the box, the larger the sample size) with the line indicating the 95% CI in each trial. The diamond shape shows the pooled effect size and the width the 95% CI.

Note: CI = confidence interval, *SD* = standard deviation, SMD = standardised mean difference.

Discussion

The present study systematically and comprehensively reviewed RCTs to assess the effect of psychological and educational interventions as an adjunct to conventional therapy on skin and psychological symptoms, and financial burden in adult AD. To this end, an attempt was made wherever possible to adhere to the Cochrane methodology of conducting systematic reviews. We not only searched the electronic databases, international conference abstracts, and references for relevant trials, but also contacted the authors of relevant studies to retrieve detailed information essential for the analyses. Thus, a large number of studies on psychological and educational interventions as the effect modifier were included. Furthermore, a meta-analysis of the relevant trials was performed to answer physicians' concerns, with statistically greater power and better quality of analyses.

This review revealed that there is currently only limited research evidence to provide a definite conclusion about the efficacy of educational and psychological approaches when used alongside conventional treatment of adult AD. A strong correlation between clinical manifestations of AD and mental burden has been well documented (Carroll et al., 2005; Linnet & Jemec, 2001). Dermatitis severity is positively associated with symptoms of anxiety and depression, and sleep deprivation, with resultant impairment of daytime functioning. Educational interventions in adolescent and adult patients improve self-care and disease control, and increase knowledge of treatments (Barbarot & Stalder, 2014; Staab et al., 2006; Williams, 2006). In confirmation of the previous studies (Chida et al., 2007; Ersser et al., 2014), addition of psychological and educational interventions to conventional treatment provided better therapeutic results regarding alleviation of eczema severity, and psychological symptoms. One study (Van Os-Medendorp et al., 2012) showed that health care prac-

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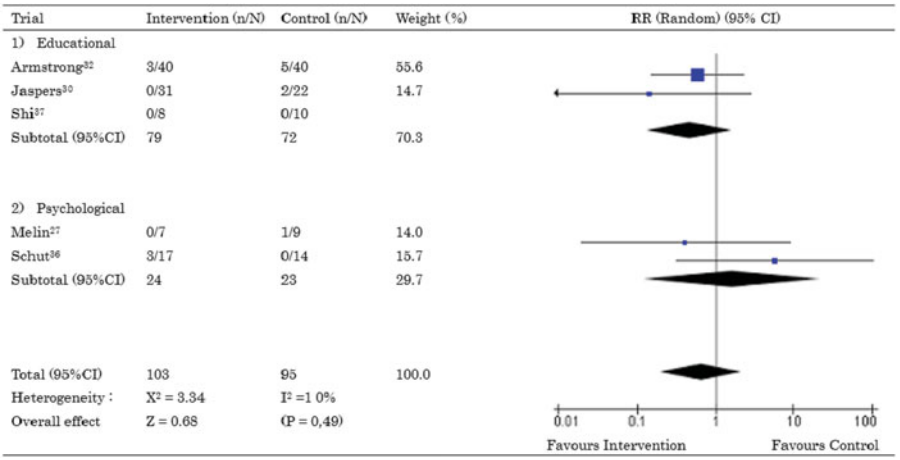


FIGURE 4

Forest plot of the dropout rate for the intervention group versus control group. The square boxes indicate effect size and sample size with the line indicating the 95% CI in each trial. The diamond shape shows the pooled effect size and the width the 95% CI.
Note: CI = confidence interval, RR = relative risk.

tice supported by electronic communication was as effective as usual face-to-face care in improving disease severity and QOL, with substantial cost savings. These results strongly suggest that psychological support and education are a promising adjunct to pharmacotherapy in AD. However, the meta-analysis showed no clear difference in the therapeutic effect of either intervention on eczema severity and the acceptability of the intervention as exemplified by the dropout rate in the two groups. Of note is the trial by Armstrong et al. (2011) showing that attainment of optimal treatment results depended on the strategy of disseminating information on AD. Good treatment results are obtained through appreciation by both patients and family members of what AD is and how to treat the disease. At the same time, clear verbal and written outlines should also be provided. In this context, an online video for patient education is an effective and appealing tool for improving clinical outcomes compared with pamphlet-based education. To maintain a satisfactory skin condition for an extended period of time, educational interventions should be regularly delivered and reinforced.

This study has several limitations. First, although we contacted authors to supplement missing data if necessary, the included trials were too small in number to perform some of the preplanned analyses. The fact that the present meta-analysis could not identify psychological and educational interventions as the effect modifier could be attributed to the low statistical power. Second, the included studies provided a range of interventions, from a single 15-minute consultation to a comprehensive series of sessions delivered to either individuals or groups. Third, the diagnostic criteria and outcome measures were heterogeneous in the included trials. The Hanifin and Rajka diagnostic criteria were employed in five trials (Armstrong et al., 2011; Bae et al., 2012; Linnet & Jemec, 2001; Schut et al., 2013; Shi et al., 2013). EASI, SCORAD, and POEM were used for the severity score. Tools for secondary outcome measures were varied and included, for example, DLQI, SF-36, Skindex-29, and VAS for QOL.

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Furthermore, a point in time for outcome measurement varied from trial to trial, suggesting that the efficacy was diverse even under the same interventions. Finally, the risk of bias was unclear or high in many trials, resulting in a meta-analysis with a limited number of the trials and only for the primary outcome measures.

Poor adherence to therapy is a significant issue in the management of AD (Bass, Anderson, & Feldman, 2015). Self-management and behavioural changes to improve adherence have been increasingly emphasised in the treatment of chronic diseases. Psychological and educational interventions may be an important option in this regard. However, this review and others (Chida et al., 2007; Ersser et al., 2014) have confirmed that the evidence base remains limited regarding the efficacy of these interventions in the management of adult AD. We conclude that, rather than the combination of these interventions with conventional therapy being of no value, the data reported to date are not sufficiently powerful to detect evidence-based efficacy.

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Conflict of Interest

The authors declare no conflicts of interest.

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