UNIVERSITY OF AMSTERDAM

UvA-DARE (Digital Academic Repository)

Is Parental Mindfulness Associated with Quality of Life and Itch Intensity in Children with Psoriasis and Eczema and Well-being in Parents?

Heapy, C.; Norman, P.; Emerson, L.-M.; Murphy, R.; Bögels, S.; Thompson, A.R.

DOI
10.1007/s12671-021-01733-2

Publication date
2021

Document Version
Final published version

Published in
Mindfulness

License
CC BY

Link to publication

Citation for published version (APA):
Heapy, C., Norman, P., Emerson, L.-M., Murphy, R., Bögels, S., & Thompson, A. R. (2021). Is Parental Mindfulness Associated with Quality of Life and Itch Intensity in Children with Psoriasis and Eczema and Well-being in Parents? *Mindfulness*, *12*(11), 2707-2717. https://doi.org/10.1007/s12671-021-01733-2

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, P.O. Box 19185, 1000 GD Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (https://dare.uva.nl)

Download date:12 Nov 2026

Mindfulness (2021) 12:2707–2717
https://doi.org/10.1007/s12671-021-01733-2

ORIGINAL PAPER

Is Parental Mindfulness Associated with Quality of Life and Itch Intensity in Children with Psoriasis and Eczema and Well-being in Parents?

Connor Heapy[1] · Paul Norman[1] · Lisa-Marie Emerson[2] · Ruth Murphy[3] · Susan Bögels[4] · Andrew R. Thompson[1,5]

Accepted: 21 August 2021 / Published online: 4 September 2021
© The Author(s) 2021

Abstract

Objectives Childhood psoriasis and eczema negatively impact the well-being of children and their parents. Identifying variables that protect against, or reduce, the negative impact of these skin conditions could greatly improve the lives of children with these skin conditions and their parents. We therefore aimed to investigate whether higher levels of parental dispositional mindfulness are associated with lower levels of psychological distress and better quality of life in children with psoriasis or eczema and their parents.

Methods Children with psoriasis or eczema ($n = 180$, M age = 10.22, females = 108) and their parents ($n = 210$, M age = 39.97, females = 183) were recruited from social media and NHS dermatology clinics in the UK. Parents completed questionnaires assessing dispositional mindfulness, parental stress, psychological distress (depression, anxiety, general stress), and quality of life related to their child's skin condition. Children completed questionnaires assessing quality of life related to their skin condition and pruritus (itch intensity).

Results Parental dispositional mindfulness explained significant amounts of variance in parental stress, parent depression, parent anxiety, parent general stress, and both parent and child quality of life. These relationships were not moderated by skin condition.

Conclusion Parental dispositional mindfulness is associated with better well-being in parents of children with psoriasis or eczema, and their children. Mindfulness-based interventions for parents may be beneficial for improving well-being in both children with skin conditions and their parents.

Trial Registration: https://aspredicted.org/xf429.pdf (see Supplementary Materials A).

Keyword Children; Mindfulness; Psoriasis; Eczema; Stress; Psychodermatology

Psoriasis and eczema are chronic inflammatory skin disorders that affect up to 2.1% and 24.6% of children worldwide respectively (Odhiambo et al., 2009; Parisi et al., 2013). Similarities exist between these conditions in appearance—both can present as red patches on the skin—and in their physical and psychological impact. Children with psoriasis often experience pain, itching, fatigue, sleep deprivation, and stigmatization (Ablett & Thompson, 2016; De Jager et al., 2011). These experiences are shared by children with eczema (Bronkhorst et al., 2016; Lewis-Jones, 2006). Both conditions require uncomfortable and time-consuming treatment regimens (Randa et al., 2018; Santer et al., 2013). In addition, children with psoriasis or eczema not only report poorer quality of life than healthy children (Bronkhorst et al., 2016; Varni et al., 2012), but also children with other skin conditions (Beattie & Lewis-Jones, 2006). Relatedly,

✉ Andrew R. Thompson
thompsona18@cardiff.ac.uk

1 Department of Psychology, University of Sheffield, Cathedral Court, 1 Vicar Lane, Sheffield S1 2LT, UK

2 School of Health Sciences, University of Canterbury, Christchurch, New Zealand

3 Sheffield Teaching Hospitals NHS Foundation Trust, Royal Hallamshire Hospital, Glossop Road, Sheffield S10 2JF, UK

4 Department of Psychology, University of Amsterdam, Nieuwe Achtergracht 129, 1018WS Amsterdam, Netherlands

5 South Wales Clinical Psychology Training Programme, School of Psychology, Cardiff University, 11th Floor, Tower Building, 70 Park Place, Cardiff CF10 3AT, UK

children with psoriasis are at increased risk of developing mental health issues, such as depression and anxiety, compared to children without skin conditions (Kimball et al., 2012). The same is true for children with eczema (Hammer-Helmich et al., 2016). Childhood psoriasis and eczema, therefore, can have a negative impact on all aspects of a child's life.

Childhood psoriasis and eczema not only negatively impact the child, but also parents, who report poor quality of life and high levels of parental stress (Bronkhorst et al., 2016; Faught et al., 2007; Lifschitz, 2015; Su et al., 1997; Tollefson et al., 2017). Parental stress is also problematic for the child, as it may impair the child's physical and psychological health, compounding the negative effects experienced as a direct result of the skin condition. Physically, parental stress may lead to deterioration in the child's skin condition, as it may reduce the parent's ability to manage the condition or to support the child in managing the condition (Emerson & Bögels, 2017; Faught et al., 2007; Wood et al., 2015). Psychologically, parental stress is associated with poorer child mental health and quality of life in children with chronic illness, including skin conditions (Cousino & Hazen, 2013; Emerson & Bögels, 2017; Wan et al., 2015). This negative relationship between parental stress and child well-being may be explained by the association between stress and parental behaviour: stressed parents exhibit more controlling and less affectionate behaviour towards their children (Crnic et al., 2005; Webster-Stratton, 1990). Understanding parent characteristics that reduce, or protect against, parental stress may therefore have a positive impact on children with skin conditions and their parents.

One parent characteristic that offers potential for reducing parental stress in parents of children with psoriasis and eczema is mindfulness. Mindfulness is a state of awareness that has been defined as "paying attention in a particular way: on purpose in the present moment and non-judgmentally" (Kabat-Zinn, 2003). Individuals vary in their dispositional mindfulness; that is, how mindful they are in their day-to-day lives (Baer, 2003). Those who are more mindful are more likely to have an increased awareness of their internal experiences (e.g. thoughts and feelings), as well as their surroundings (e.g. noticing the sounds and smells and in their environment). Dispositional mindfulness has been found to relate to positive well-being in the general population (Brown & Ryan, 2003) and with lower levels of stress (general and parental), depression, and anxiety in parents (Corthorn & Milicic, 2016). However, relatively little is known about the specific association between mindfulness and parental stress in childhood psoriasis and childhood eczema.

Overall, research suggests psoriasis and eczema have a significant negative impact on the well-being (mental health and quality of life) of children and their parents, and that mindfulness may help to improve well-being in these individuals. This study is the first to investigate the relationship between parental dispositional mindfulness, and a range of well-being variables in children with psoriasis or eczema and their parents. We were particularly interested in the relationship between mindfulness and parental stress, due to its negative systemic impact—on parents *and* children. We hypothesised that parental dispositional mindfulness would be associated with lower levels of parental stress, depression, anxiety, general stress, and higher levels of parent quality of life. We also hypothesised that parental dispositional mindfulness would be associated with higher levels of child quality of life and lower levels of itch intensity.

Method

Participants

The sample comprised children with psoriasis or eczema and/or their parents or carers. In total, 210 parents/carers (one per family) completed the questionnaires (females n=183; M *age*=39.97; SD=7.16). The children of 30 of these parents chose not to participate in the study. As a result, 180 children completed the questionnaires (females n=108; diagnosed with eczema n=125; M age=10.22, SD=0.29; see Table 1). Of the parent participants, 43 were recruited using social media, and 167 were recruited from 15 NHS hospital clinics based around the UK.

Procedure

Parent–child dyads were recruited from two sources—NHS clinics and online via social media—using a convenience sampling method. Participants recruited from NHS clinics completed hard copies of questionnaires either directly before or after a clinic visit, or at home. Participants who were recruited online completed the questionnaire using the survey platform, Qualtrics (Provo, UT, USA). The questionnaires were also advertised using social media. Inclusion criteria were (i) child aged 4–17 years with psoriasis or eczema; (ii) parent of a child with psoriasis or eczema; and (iii) fluent English speaker. Each parent who completed the questionnaires was entered into a prize draw for the chance to win one of four £50 gift vouchers. Ethical approval was obtained from the Health Research Authority (NHS Yorkshire & The Humber—Sheffield Research Ethics Committee) and the study was pre-registered at https://aspredicted.org/xf429.pdf (see Supplementary Materials A). Participants completed questionnaires in the order presented below.

Table 1 Demographic, medical, and well-being characteristics of sample

Parents			
Age		$M = 39.97$, $SD = 7.16$	
Gender	Male	25	
	Female	183	
Employment status	Employed	139	
	Unemployed	68	
Ethnicity	White British	149	
	Minority ethnicities		
	Arab	1	
	African/British-African	5	
	Australian	2	
	Bangladeshi/British-Bangladeshi	4	
	Caribbean/British-Caribbean	11	
	Chinese/British-Chinese	4	
	Indian/British-Indian	7	
	Italian-Irish	1	
	Pakistani/British-Pakistani	14	
	Polish	1	
	Russian	1	
	White and Asian	4	
	White and Black African	1	
	White Gypsy/Irish Traveller	1	
Education	Secondary school or lower	59	
	Post-secondary school	66	
	Undergraduate degree	50	
	Postgraduate degree	31	
Dispositional mindfulness (FFMQ total)		$M = 125.03$, $SD = 19.30$	
Parental stress (PIP frequency)		$M = 95.27$, $SD = 33.32$	
Parental stress (PIP difficulty)		$M = 93.92$, $SD = 36.68$	
Depression (DASS-21)		$M = 6.08$, $SD = 6.40$	
Anxiety (DASS-21)		$M = 5.57$, $SD = 5.44$	
General stress (DASS-21)		$M = 8.50$, $SD = 6.26$	
Quality of life (FDLQI)		$M = 12.68$, $SD = 7.67$	
Children			
Age			$M = 10.22$, $SD = 0.29$
Gender		Male	72
		Female	108
Condition		Psoriasis	55
		Eczema	125
Other medical conditions		Yes	81
		No	97
Skin condition severity		Mild	26
		Moderate	79
		Severe	74
Quality of life (CDLQI)			$M = 10$, $SD = 7.17$
Itch intensity			$M = 6.24$, $SD = 2.03$

Note: *FDLQI* Family Dermatology Life Quality Index (scores range from 0 to 30); *CDLQI* Child Dermatology Life Quality Index (scores range from 0 to 30); *DASS* Depression Anxiety and Stress Scale (scores range from 0 to 21 for each of the Depression, Anxiety, and Stress subscales); *PIP* Paediatric Inventory for Parents (scores range from 42 to 210 for both Frequency and Difficulty subscales); *FFMQ* Five-Factor Mindfulness Questionnaire (scores range from 39 to 195)

Where parent $n \neq 210$, and child $n \neq 180$, participants have not provided that information

Measures

Parents reported their own age, gender, ethnicity, employment status, and education level, as well as their child's age and gender. Parents provided medical information about their child, including comorbid medical conditions, duration of condition, and perceived skin condition severity (rated 'mild', 'moderate', or 'severe').

The Five-Factor Mindfulness Questionnaire (FFMQ; Baer et al., 2006) assessed parental dispositional mindfulness. This 39-item self-report questionnaire measures five facets of mindfulness: observing, describing, acting with awareness, non-judgement of inner experience, and non-reactivity to inner experience. Items are rated on 5-point Likert scales ranging from 1 ('*never or very rarely true*') to 5 ('*very often or always true*'), and responses to each facet are summed. The FFMQ has demonstrated convergent validity in relation to a number of variables that are conceptually related to mindfulness (openness to experience, emotional intelligence, self-compassion), and divergent validity in relation to a number of variables that are conceptually unrelated to mindfulness (neuroticism, psychological symptoms, thought suppression) in a non-clinical sample (Baer et al., 2006). Previously, internal consistency for the FFMQ subscales was found to be good in a non-clinical sample (e.g. range α=0.75–0.91; Baer et al., 2006). In the current study, internal consistency for the full scale and subscales was also good (range α=0.80–0.91).

The Paediatric Inventory for Parents (PIP; Streisand et al., 2001) assessed levels of parental stress related to their child's skin condition. This 42-item self-report questionnaire measures the frequency and difficulty of a range of scenarios that may be experienced by parents of children with an illness over the past week (Streisand et al., 2001). Items are rated on a 5-point Likert scale ranging from 1 ('*never*' or '*not at all*') to 5 ('*very often*' or '*extremely*'), and responses for frequency and difficulty are summed separately. The PIP has demonstrated good psychometric properties in parents of children with a range of different health conditions (e.g. diabetes, Lewin et al., 2005; cancer, Streisand et al., 2001). For example, in a sample of parents of children with type 1 diabetes, the PIP demonstrated good internal consistency (frequency α=0.97; difficulty α=0.94) and convergent validity in relation to maternal anxiety and child mental health difficulties. In the current study, internal consistency for the frequency total score was α=0.96 and for the difficulty total score was α=0.95.

The Depression, Anxiety, and Stress Scale (DASS-21; Henry & Crawford, 2005; Lovibond & Lovibond, 1995) assessed parent's levels of depression, anxiety, and general stress over the past week. This self-report questionnaire comprises 21-items, each rated on a 4-point Likert scale ranging from 0 ('*never*') to 3 ('a*lmost always*'), and responses for each subscale are summed. The DASS-21 has demonstrated convergent and divergent validity in relation to other measures of depression and anxiety in non-clinical samples (e.g. Antony et al., 1998; Henry & Crawford, 2005). Previously, internal consistency for the DASS-21 total scale and subscales has been found to be good in non-clinical samples (e.g. range α=0.82–0.93; Henry & Crawford, 2005). In this study, the internal consistency of the DASS-21 total scores and subscale scores was also good (α=0.92–0.97).

The Family Dermatology Life Quality Index (FDLQI; Basra et al., 2007) assessed parental quality of life related to the child's skin condition. This self-report measure comprises 10 items assessing a range of ways that a family member's skin condition may affect an individual's quality of life over the past month. For the current study, the phrase "relative/partner's skin disease" was changed to "child's skin disease". Items are rated on 4-point Likert scales ranging from 0 ("not at all") to 3 ("very much"), and responses were summed. The FDLQI has demonstrated convergent validity in relation to the family member skin-related quality of life score (Basra et al., 2007). The FDLQI has demonstrated good internal consistency (α=0.88) and test–retest reliability (intraclass correlation=0.94) in individuals with a range of skin conditions (Basra et al., 2007). In the current study, internal consistency of the FDLQI was α=0.91.

The Children's Dermatology Life Quality Index (CDLQI; Lewis-Jones & Finlay, 1995) assessed children's quality of life related to their skin condition. This self-report measure comprises 10 items assessing the extent to which a child's skin condition has impacted different aspects of their life over the past week. Items are rated on a 4-point Likert scale ranging from 0 ("*not at all*") to 3 ("*very much*"), and responses are summed. The CDLQI has demonstrated convergent validity in relation to a range of conceptually related variables (e.g. impact of the skin condition on family members, severity of skin condition), and divergent validity through higher scores in children with a skin condition than those without (see Salek et al., 2013, for a review). The cartoon version of the measure, which has demonstrated similar psychometric properties to the standard version (Holme et al., 2003), was used for those children in the current study who were 10 years old or younger. The CDLQI has demonstrated good internal consistency in children with a range of skin conditions (range α=0.82–0.92). Internal consistency for the CDLQI in this study was α=0.88.

Itch intensity was assessed by asking children to rate "how itchy is your psoriasis/eczema?" using a visual analogue scale ranging from 0 to 10 ('0'=no itch; '10'=worst imaginable itch). This method of assessing itch has been recommended by the special interest group on scoring itch in clinical trials (Ständer et al., 2013).

Data Analyses

Descriptive statistics were used to present demographic, medical, and well-being characteristics of the participants. Parents and children with psoriasis versus eczema were also compared on these variables using *t*-tests or chi-squared tests (see Supplementary Materials B).

Associations between the demographic variables (age, gender, employment status, ethnicity, education level), medical variables (duration of condition, skin condition severity, skin condition, other medical conditions), parental stress, psychological distress (anxiety, depression, general stress), quality of life (parent and child), and itch intensity were assessed using *t*-tests or correlations (see Supplementary Materials C, Table 1; these analyses were also run separately for those with eczema and those with psoriasis; see Supplementary Materials C, Tables 3 and 5).

Associations between parental dispositional mindfulness and measures of parental stress, psychological distress, quality of life (parent and child), and itch intensity were assessed using bivariate correlation analyses (Table 2; see Supplementary Materials C, Table 2, 4, and 6 for the full correlation matrices for the full sample, for those with eczema, and for those with psoriasis). Regression analyses were then conducted to examine the amounts of variance in the parent and child outcomes explained by mindfulness (four facets of the FFMQ) controlling for any significant demographic or medical variables (Tables 3 and 4). These analyses were repeated as moderated regression analyses using the PROCESS macro in SPSS, with skin condition as the moderator variable, to test whether relationships between the FFMQ subscales and parent and child outcomes differed for the two groups (see Supplementary Materials D). The observe subscale of the FFMQ was not included in the regression analyses as it had relatively small correlations with the FFMQ total scale (r=0.38 vs r=0.53–0.81 for the other subscales) and was differentially related to some of the well-being variables (e.g. positively related to anxiety; r=0.21). This is in line with research suggesting the observed facet may not be measuring mindful awareness in non-meditators and should be omitted from analyses (Baer et al., 2008; Cohen, 1988). Demographic or medical variables that were significantly associated with the dependent variables were controlled for in the regression analyses.

Multicollinearity among the independent variables was tested in two ways. First, correlations between the independent variables were examined. Second, collinearity statistics (i.e. tolerance, variance inflation factors) and collinearity diagnostics (i.e. condition index, variance proportions) were computed for all regression analyses. None of these tests indicated that multicollinearity was a cause for concern (i.e. coefficients <0.80; tolerance values >0.20; variance inflation factors <10; condition index <30; variance proportions, for each independent variable, only one value >0.50, Field, 2005; Tabachnick & Fidell, 1996).

Results

Descriptive Statistics

Demographic, medical, and well-being variables are summarised in Table 1. *T*-tests and chi-squared tests comparing

Table 2 Correlations between parental dispositional mindfulness, parental stress, parental psychological distress (depression, anxiety, depression), quality of life (parent and child), and itch intensity

		Dispositional mindfulness (FFMQ)			
		Describe	Acting with awareness	Non-judgement	Non-reactivity
Parent outcomes	Parental stress (PIP frequency)	−.30***	−.47***	−.41***	−.03
	Parental stress (PIP difficulty)	−.29***	−.51***	−.43***	−.02
	Depression (DASS-21)	−.34***	−.58***	−.55***	−.02
	Anxiety (DASS-21)	−.29***	−.50***	−.53***	−.02
	General stress (DASS-21)	−.29***	−.60***	−.57***	−.01
	Quality of life (FDLQI)	−.23**	−.33***	−.27***	.03
Child outcomes	Quality of life (CDLQI)	−.17*	−.26***	−.23**	.01
	Itch intensity	−.11	−.15*	−.16*	−.02

Note. *FDLQI* Family Dermatology Life Quality Index; *CDLQI* Child Dermatology Life Quality Index; *DASS* Depression, Anxiety, and Stress Scale; *PIP* Peadiatric Inventory for Parents; *FFMQ* Five-Factor Mindfulness Questionnaire

*$P \leq .05$

**$P \leq .01$

***$P \leq .001$

Table 3 Summary of hierarchical multiple regression analyses predicting parent outcomes from parental dispositional mindfulness controlling for demographic and medical variables

		Parent stress	Parent stress	Depression	Anxiety	General stress	Quality of life
Block	Variable	Frequency (PIP)	Difficulty (PIP)	(DASS-21)	(DASS-21)	(DASS-21)	(FDLQI)
1.	Employment status	.06			.15*		.07
	Ethnicity	.16*	.20**				.16**
	Education level				.10	.12	
	Skin condition severity	.27***	.24***			.09	.45***
	Skin condition					−.03	.01
	Other medical conditions	−.18**	−.17**	−.10	−.11	−.06	−.15*
2.	FFMQ Describe	−.11	−.06	−.13	.12	−.04	−.13
	FFMQ Acting with awareness	−.27***	−.36***	−.34***	−.23**	−.38***	−.17*
	FFMQ Non-judgement	−.16*	−.13	−.29***	−.31***	−.28***	−.08
	FFMQ Non-reactivity	.02	−.01	−.02	−.02	−.09	.09
ΔR^2		.19***	.22***	.39***	.29***	.36***	.09***
R^2		.38***	.40***	.41***	.38***	.44***	.39***

Note. Values are standardised betas from the final regression models. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Table 4 Summary of hierarchical multiple regression analyses predicting child outcomes from parental dispositional mindfulness, controlling for demographic and medical variables

Block	Variable	Quality of life (CDLQI)	Itch intensity
1.	Skin condition severity	.36***	.30***
	Skin condition	-	−.13
	Other medical conditions	−.16*	−.15*
2.	FFMQ Describe	−.10	−.06
	FFMQ Acting with awareness	−.02	.03
	FFMQ Non-judgement	−.16	−.12
	FFMQ Non-reactivity	.04	−.01
ΔR^2		.05*	.02
R^2		.24***	.17***

Note. Values are standardised betas from the final regression models
* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

the two groups on demographic, medical, and well-being variables are reported in Supplementary Materials B.

Correlations and *t*-tests between demographic, medical, and well-being variables are summarised in Supplementary Materials C, Table 1.

Associations Between Mindfulness and Well-being

Correlations between parental dispositional mindfulness and the parent and child well-being variables are summarised in Table 2 (see Supplementary Materials C, Table 2, for a full correlation matrix). The describe, acting with awareness, and non-judgement of inner experience subscales of the FFMQ were all significantly correlated with each of the following outcomes: parental stress, depression, anxiety, general stress, parental quality of life, and child quality of life. The acting with awareness and non-judgement subscale was also significantly correlated with itch intensity.

Parent Outcomes

Parental Stress

The four dispositional mindfulness facets explained an additional 19% of the variance in parental stress (PIP total frequency) after controlling for employment status, ethnicity, skin condition severity, and other medical conditions, ΔR^2=0.19, $F(4, 185) = 14.36$, $p<0.001$ (see Table 3). Together, these variables explained 38% of the variance in parental stress, R^2= 0.38, adjusted R^2= 0.36, $F(8, 185) = 14.38$, $p<0.001$, with ethnicity, skin condition severity, other medical conditions, FFMQ acting with awareness, and FFMQ non-judgement as significant independent predictors.

Similarly, the four mindfulness facets explained an additional 22% of the variance in parental stress (PIP total difficulty) after controlling for ethnicity, skin condition severity, and other medical conditions ΔR=0.22, $F(4, 183) = 16.83$, $p<0.001$. Together, these variables explained 40% of the variance in parental stress, R^2=0.40, adjusted R= 0.38, $F(7, 183) = 17.27$, $p<0.001$, with ethnicity, skin condition severity, other medical conditions, and FFMQ acting with awareness as significant independent predictors.

Psychological Distress

The four dispositional mindfulness facets explained an additional 39% of the variance in depression after controlling other medical conditions, ΔR^2= 0.39, $F(4, 196) = 32.21$,

$p<0.001$. Together, these variables explained 41% of the variance in depression, $R^2= 41$, adjusted $R^2= 0.40$, $F(5, 196) = 27.44$, $p<0.001$, with FFMQ acting with awareness and FFMQ non-judgement as significant independent predictors.

The four mindfulness facets explained an additional 29% of the variance in anxiety after controlling for employment status, education level, and other medical conditions, $\Delta R^2= 0.29$, $F(4, 190) = 22.38$, $p<0.001$. Together, these variables explained 38% of the variance in anxiety, $R^2= 0.38$, adjusted $R^2= 0.36$, $F(7, 190) = 16.64$, $p<0.001$, with employment status, FFMQ acting with awareness and FFMQ non-judgement as significant independent predictors.

The four mindfulness facets explained an additional 36% of the variance in general stress after controlling for education, skin condition, skin condition severity, and other medical conditions, $\Delta R= 0.36$, $F(4, 188) = 30.63$, $p<0.001$. Together, these variables explained 45% of the variance in general stress, $R^2= 0.45$, adjusted $R^2=0.42$, $F(8, 188) = 18.57$, $p<0.001$, with FFMQ acting with awareness and FFMQ non-judgement as significant independent predictors.

Quality of Life

The four mindfulness facets explained an additional 9% of the variance in quality of life after controlling for employment, ethnicity, skin condition severity, skin condition, and other medical conditions $\Delta R^2= 0.09$, $F(4, 186) = 6.68$, $p<0.001$. Together, these variables explained 39% of the variance in quality of life, $R^2=0.39$, adjusted $R=0.36$, $F(9, 186) = 13.25$, $p<0.001$, with ethnicity, skin condition severity, other medical conditions, and FFMQ acting with awareness as significant independent predictors.

Child Outcomes

Quality of Life

The four mindfulness facets explained an additional 5% of the variance in quality of life after controlling for skin condition severity and other medical conditions, $\Delta R^2=0.05$, $F(4, 167) = 2.91$, $p=0.027$ (see Table 4). Together, these variables explained 24% of the variance in quality of life, $R^2=0.24$, adjusted $R^2=0.21$, $F(6, 167) = 8.56$, $p<0.001$, with skin condition severity, and other medical conditions as significant independent predictors. Of the mindfulness facets, non-judgement of inner experience was closest to being a significant predictor (β=−0.16; 95% CI [−0.34, 0.01]).

Itch Intensity

The four mindfulness facets did not explain any additional variance in itch intensity. Together, skin condition severity, skin condition, other medical conditions, and the four mindfulness facets explained 17% of variances in itch intensity, $R^2=0.17$, adjusted $R^2=0.14$, $F(7, 164) = 4.95$, $p<0.001$, with skin condition severity and other medical conditions as significant predictors.

Moderated Regression Analyses

All interaction terms between the FFMQ subscales and skin condition were found to be non-significant (see Supplementary Materials D), thereby indicating that relationships between mindfulness and the child and parent outcomes did not differ by skin condition (i.e. psoriasis versus eczema).

Discussion

The current study investigated the relationship between mindfulness and well-being (mental health and quality of life) in children with psoriasis or eczema and their parents. As predicted, higher levels of dispositional mindfulness in parents were related to lower parental psychological distress (including parental stress), and higher levels of parent quality of life. Regression analyses indicated that parental dispositional mindfulness explained significant amounts of variance in parental psychological distress and quality of life. This finding aligns with evidence showing the benefits of mindfulness for psychological distress (Khoury et al., 2013). Also in line with predictions, parental dispositional mindfulness was associated with better child quality of life. Regression analyses revealed that parental dispositional mindfulness explained significant amounts of variance in child quality of life. Partially in line with predictions, parental dispositional mindfulness was correlated with itch intensity, but did not explain a significant amount of unique variance in itch intensity in the regression analysis. Overall, these findings suggest parental dispositional mindfulness is closely related to the well-being of children with psoriasis or eczema, and their parents, but less so to the intensity of itch that children with these skin conditions experience.

We were particularly interested in the relationship between mindfulness and parental stress, due to the negative impact of parental stress on parents and children (Emerson & Bögels, 2017; Wan et al., 2015). Both acting with awareness and non-judgement of inner experience explained significant amounts of variance in parental stress. Acting with awareness refers to the ability to attend to a task at hand, and is the opposite act to functioning on "autopilot" (Baer et al., 2008). Non-judgement of inner experience refers to the ability to attend to inner thoughts and feelings, without evaluation (Baer et al., 2008). These findings suggest that parents who are able to pay attention to their current activities without distraction, whilst also being able to recognize thoughts and feelings without being self-critical, are less

likely to experience high levels of parental stress associated with parenting a child with a chronic skin disease.

The acting with awareness and non-judgement of inner experience facets were also most relevant to other aspects of parental well-being. The acting with awareness facet demonstrated the strongest relationships with parental well-being variables, explaining significant amounts of variance in parental psychological distress and quality of life. Non-judging of inner experience also explained significant amounts of variance in psychological distress, but was not related to quality of life. The describe and non-reactivity to inner experience facets, on the other hand, did not explain significant variance in parental well-being. These facets refer to an individual's ability to label their feelings with words, and recognize their feelings and inner experiences without attempting to change or control them. It was hypothesised that parents who scored highly on these facets would experience less psychological distress. For example, parents high in "describe" should be better able to communicate their feelings to others and seek help. However, these facets were found to be non-significant in the regression analyses. Overall, the current findings are in line with previous research that demonstrates the acting with awareness and non-judgement of inner experience facets of mindfulness are the most important predictors of psychological distress in adults (Baer et al., 2006; Cash & Whittingham, 2010).

In terms of the child outcome variables, three mindfulness facets in parents were correlated with child quality of life: describe, acting with awareness and non-judgement of inner experience. Regression analyses indicated that together, the four mindfulness facets explained small amounts of variance in child quality of life. This finding may reflect that parents who are more mindful have more positive relationships with their child due to increased individual well-being, improved emotional skillfulness, and healthier stress responses (Bögels & Emerson, 2018). As a result, these parents may be better able to help and support their child in living with the skin condition and overcoming related obstacles (e.g. helping them form friendships). Future studies should formally test these ideas.

Our findings indicate that parental mindfulness is not an important factor in the intensity of itch experienced by children with psoriasis or eczema. Although correlational analysis showed parental dispositional mindfulness was related to itch intensity, regression analysis showed that it did not predict significant amounts of variance in itch intensity when controlling for skin condition, skin condition severity, and other medical conditions. We initially posited that if parental dispositional mindfulness was a predictor of parent well-being (particularly parental stress), then these parents may also be better equipped to manage the condition or support the child in managing the condition, thus the child's skin would not be as itchy (e.g. Emerson & Bögels, 2017). But our findings suggest that this is not the case. However, the management of skin conditions is broader than itch intensity alone; a child's skin condition may be considered medically well-managed, but remain itchy. Whilst itch intensity provided a subjective rating, it may be a poor indicator of condition management. Therefore, future studies investigating the relationship between mindfulness and skin condition management could consider the use of multiple and objective measures, such as adherence, doctor's rating of severity of the child's skin condition, and parent and child's self-efficacy in condition management.

Limitations and Future Research

There were some limitations to the current study. Only 55 children with psoriasis were recruited into the study, as opposed to 125 with eczema. As a result, it was not possible to run separate regression analyses due to low statistical power. Instead, moderated regression analyses tested whether skin condition moderated relationships between mindfulness and the child and parent outcomes. All moderation effects were non-significant, indicating that the relationships were similar across both skin conditions. The cross-sectional design means it cannot be assumed that increased mindfulness leads to improved well-being. It is possible that parents who are more stressed also have reduced capacity for mindful awareness. In addition, children were only assessed on quality of life and itch and it may have been useful to investigate the relationships between parental mindfulness and other child variables, such as depression and anxiety. It may have also been informative to assess the relationship between child dispositional mindfulness and parent and child well-being (including itch intensity). However, this would have been difficult in a large proportion of our sample, as current measures of dispositional mindfulness in children are validated for those aged 8 years and above (Goodman et al., 2017).

A further limitation of this study is that common method bias may have been introduced due to using self-report questionnaires to assess all constructs (Podsakoff et al., 2003, 2012). In other words, the likelihood of inflated or spurious correlations may have increased due to biases common to self-report measures, such as response styles or social desirability. We attempted to overcome this limitation by emphasising to participants that their responses were anonymous and there were no right or wrong answers to the questions. In addition, children completed questionnaires themselves, rather than their parents on their behalf. Nonetheless, future studies should seek to further overcome this limitation by introducing another sources of measurement, such as objective measures of parent mindfulness (e.g. see Wong et al., 2018) or clinical ratings of disease severity.

There were also some strengths to the current study that should be highlighted. In particular, a large diverse sample of participants was recruited from clinics and community settings in the UK. In addition, important clinical and demographic variables were measured and controlled for in the analyses.

Future studies could assess the relationship between child dispositional mindfulness and well-being in older children (i.e. 8 years or older) with skin conditions, as the relationship may be stronger than the relationship between parent dispositional mindfulness and child well-being. Future studies with this population could also assess how often parents practice mindfulness—particularly studies testing the efficacy of mindfulness interventions—as this can increase dispositional mindfulness (Kiken et al., 2015). Parents who practice mindfulness more regularly would be expected to have higher well-being than those who practice less regularly. Finally, future studies are needed to test whether mindfulness-based interventions improve well-being in children with skin conditions and their parents.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12671-021-01733-2.

Acknowledgements We would like to thank all of the individuals working at participating the 15 NHS sites who helped with recruitment for this study.

Author Contribution CH contributed to the design and execution of the study, conducted the data analyses, and wrote the paper. PN contributed to the design of the study, the data analyses, and the writing of the paper. L-ME contributed to the design of the study and the writing of the paper. RM contributed to the execution of the study and the writing of the paper. SB contributed to the writing of the paper. AT designed the study and contributed to the data analyses and writing of the paper. All authors approved the final version of the manuscript for submission.

Funding The study was funded by a grant from the Psoriasis and Psoriatic Arthritis Association (PAPAA). The research team acknowledges the support of the National Institute for Health Research Clinical Research Network (NIHR CRN).

Data Availability All data are available at the Open Science Framework (https://osf.io/6cr8w/).

Declarations

Ethical Approval Ethical approval was obtained from the Health Research Authority (NHS Yorkshire & The Humber—Sheffield Research Ethics Committee, UK). The research was therefore in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Informed Consent All adult participants provided informed consent for themselves and their children prior to participating in this study. All child participants also provided assent prior to participation.

Patient Involvement A parent of a child with eczema, and an adolescent with psoriasis, reviewed the materials (information sheets, consent forms, questionnaires) for this study, prior to recruitment.

Conflict of Interest The authors declare no competing interests.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/.

References

Ablett, K., & Thompson, A. R. (2016). Parental, child, and adolescent experience of chronic skin conditions: A meta-ethnography and review of the qualitative literature. *Body Image, 19*, 175–185. https://doi.org/10.1016/j.bodyim.2016.10.001

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*(2), 176–181. https://doi.org/10.1037/1040-3590.10.2.176

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*(2), 125–143. https://doi.org/10.1093/clipsy.bpg015

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27–45. https://doi.org/10.1177/1073191105283504

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, J. M. G. (2008). Construct validity of the Five Facet Mindfulness Questionnaire in meditating and nonmeditating samples. *Assessment, 15*(3), 329–342. https://doi.org/10.1177/1073191107313003

Basra, M. K. A., Sue-Ho, R., & Finlay, A. (2007). The Family Dermatology Life Quality Index: Measuring the secondary impact of skin disease. *British Journal of Dermatology, 156*(3), 528–538. https://doi.org/10.1111/j.1365-2133.2006.07617.x

Beattie, P., & Lewis-Jones, M. S. (2006). A comparative study of impairment of quality of life in children with skin disease and children with other chronic childhood diseases. *British Journal of Dermatology, 155*(1), 145–151. https://doi.org/10.1111/j.1365-2133.2006.07185.x

Bögels, S. M., & Emerson, L.-M. (2018). The mindful family: A systemic approach to mindfulness, relational functioning, and somatic and mental health. *Current Opinion in Psychology, 28*, 138–142. https://doi.org/10.1016/j.copsyc.2018.12.001

Bronkhorst, E., Schellack, N., & Motswaledi, M. H. (2016). Effects of childhood atopic eczema on the quality of life. *Current Allergy & Clinical Immunology, 29*(1), 18–22.

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of*

Personality and Social Psychology, 84(4), 822–848. https://doi.org/10.1037/0022-3514.84.4.822

Cash, M., & Whittingham, K. (2010). What facets of mindfulness contribute to psychological well-being and depressive, anxious, and stress-related symptomatology? *Mindfulness, 1*(3), 177–182. https://doi.org/10.1007/s12671-010-0023-4

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Earlbaum Associates. Coles.

Corthorn, C., & Milicic, N. (2016). Mindfulness and parenting: A correlational study of non-meditating mothers of preschool children. *Journal of Child and Family Studies, 25*(5), 1672–1683. https://doi.org/10.1007/s10826-015-0319-z

Cousino, M. K., & Hazen, R. A. (2013). Parenting stress among caregivers of children with chronic illness: A systematic review. *Journal of Pediatric Psychology, 38*(8), 809–828. https://doi.org/10.1093/jpepsy/jst049

Crnic, K., Gaze, C., & Hoffman, C. (2005). Cumulative parenting stress across the preschool period: Relations to maternal parenting and child behaviour at age 5. *Infant and Child Development, 14*(2), 117–132. https://doi.org/10.1002/icd.384

De Jager, M. E., De Jong, E. M., Evers, A. W., Van De Kerkhof, P. C., & Seyger, M. M. (2011). The burden of childhood psoriasis. *Pediatric Dermatology, 28*(6), 736–737. https://doi.org/10.1111/j.1525-1470.2011.01489.x

Emerson, L.-M., & Bögels, S. M. (2017). A systemic approach to pediatric chronic health conditions: Why we need to address parental stress. *Journal of Child and Family Studies, 26*(9), 2347–2348. https://doi.org/10.1007/s10826-017-0831-4

Faught, J., Bierl, C., Barton, B., & Kemp, A. (2007). Stress in mothers of young children with eczema. *Archives of Disease in Childhood, 92*(8), 683–686. https://doi.org/10.1136/adc.2006.112268

Field, A. (2005). *Discovering statistics using SPSS* (2nd ed.). Sage.

Goodman, M. S., Madni, L. A., & Semple, R. J. (2017). Measuring mindfulness in youth: Review of current assessments, challenges, and future directions. *Mindfulness, 8*(6), 1409–1420. https://doi.org/10.1007/s12671-017-0719-9

Hammer-Helmich, L., Linneberg, A., Obel, C., Thomsen, S. F., Møllehave, L. T., & Glümer, C. (2016). Mental health associations with eczema, asthma and hay fever in children: A cross-sectional survey. *British Medical Journal Open, 6*(10), e012637. https://doi.org/10.1136/bmjopen-2016-012637

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 44*(2), 227–239. https://doi.org/10.1348/014466505X29657

Holme, S. A., Man, I., Sharpe, J. L., Dykes, P. J., Lewis-Jones, M. S., & Finlay, A. Y. (2003). The Children's Dermatology Life Quality Index: Validation of the cartoon version. *British Journal of Dermatology, 148*(2), 285–290. https://doi.org/10.1046/j.1365-2133.2003.05157.x

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10*(2), 144–156. https://doi.org/10.1093/clipsy.bpg016

Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., Chapleau, M. A., Paquin, K., & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review, 33*(6), 763–771. https://doi.org/10.1016/j.cpr.2013.05.005

Kiken, L. G., Garland, E. L., Bluth, K., Palsson, O. S., & Gaylord, S. A. (2015). From a state to a trait: Trajectories of state mindfulness in meditation during intervention predict changes in trait mindfulness. *Personality and Individual Differences, 81*, 41–46. https://doi.org/10.1016/j.paid.2014.12.044

Kimball, A. B., Wu, E. Q., Guérin, A., Yu, A., Tsaneva, M., Gupta, S. R., Bao, Y., & Mulani, P. M. (2012). Risks of developing psychiatric disorders in pediatric patients with psoriasis. *Journal of the American Academy of Dermatology, 67*(4), 651-7.e1–2. https://doi.org/10.1016/j.jaad.2011.11.948

Lewin, A. B., Storch, E. A., Silverstein, J. H., Baumeister, A. L., Strawser, M. S., & Geffken, G. R. (2005). Validation of the Pediatric Inventory for Parents in mothers of children with type 1 diabetes: An examination of parenting stress, anxiety, and childhood psychopathology. *Families, Systems, & Health, 23*(1), 56–65. https://doi.org/10.1037/1091-7527.23.1.56

Lewis-Jones, M. S. (2006). Quality of life and childhood atopic dermatitis: The misery of living with childhood eczema. *International Journal of Clinical Practice, 60*(8), 984–992. https://doi.org/10.1111/j.1742-1241.2006.01047.x

Lewis-Jones, M. S., & Finlay, A. Y. (1995). The Children's Dermatology Life Quality Index (CDLQI): Initial validation and practical use. *British Journal of Dermatology, 132*(6), 942–949. https://doi.org/10.1111/j.1365-2133.1995.tb16953.x

Lifschitz, C. (2015). The impact of atopic dermatitis on quality of life. *Annals of Nutrition and Metabolism, 66*, 34–40. https://doi.org/10.1159/000370226

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*(3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-u

Odhiambo, J., Williams, H., Clayton, T., Robertson, C., Asher, M., et al. (2009). Global variations in prevalence of eczema symptoms in children from ISAAC Phase Three. *Journal of Allergy and Clinical Immunology, 124*(6), 1251-1258.e23. https://doi.org/10.1016/j.jaci.2009.10.009

Parisi, R., Symmons, D. P. M., Griffiths, C. E. M., Ashcroft, D. M., et al. (2013). Global epidemiology of psoriasis: A systematic review of incidence and prevalence. *Journal of Investigative Dermatology, 133*(2), 377–385. https://doi.org/10.1038/jid.2012.339

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879. https://doi.org/10.1037/0021-9010.88.5.879

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*, 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Randa, H., Lomholt, J. J., Skov, L., & Zachariae, R. (2018). Health-related quality of life in adolescents with psoriasis: An interview-based study. *British Journal of Dermatology, 178*(6), 1404–1411. https://doi.org/10.1111/bjd.16326

Salek, M. S., Jung, S., Brincat-Ruffini, L. A., MacFarlane, L., Lewis-Jones, M. S., Basra, M. K. A., & Finlay, A. Y. (2013). Clinical experience and psychometric properties of the Children's Dermatology Life Quality Index (CDLQI), 1995–2012. *British Journal of Dermatology, 169*(4), 734–759. https://doi.org/10.1111/bjd.12437

Santer, M., Burgess, H., Yardley, L., Ersser, S. J., Lewis-Jones, S., Muller, I., Hugh, C., & Little, P. (2013). Managing childhood eczema: Qualitative study exploring carers' experiences of barriers and facilitators to treatment adherence. *Journal of Advanced Nursing, 69*(11), 2493–2501. https://doi.org/10.1111/jan.12133

Ständer, S., Augustin, M., Reich, A., Blome, C., Ebata, T., Phan, N. Q., & Szepietowski, J. C. (2013). Pruritus assessment in clinical trials: Consensus recommendations from the International Forum for the Study of Itch (IFSI) Special Interest Group Scoring Itch

in Clinical Trials. *Acta Dermato-Venereologica, 93*(5), 509–514. https://doi.org/10.2340/00015555-1620

Streisand, R., Braniecki, S., Tercyak, K. P., & Kazak, A. E. (2001). Childhood illness-related parenting stress: The Pediatric Inventory for Parents. *Journal of Pediatric Psychology, 26*(3), 155–162. https://doi.org/10.1093/jpepsy/26.3.155

Su, J. C., Kemp, A. S., Varigos, G. A., & Nolan, T. M. (1997). Atopic eczema: Its impact on the family and financial cost. *Archives of Disease in Childhood, 76*(2), 159–162. https://doi.org/10.1136/adc.76.2.159

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics*. Harper Collins.

Tollefson, M. M., Finnie, D. M., Schoch, J. J., & Eton, D. T. (2017). Impact of childhood psoriasis on parents of affected children. *Journal of the American Academy of Dermatology, 76*(2), 286-289.e5. https://doi.org/10.1016/j.jaad.2016.09.014

Varni, J. W., Globe, D. R., Gandra, S. R., Harrison, D. J., Hooper, M., & Baumgartner, S. (2012). Health-related quality of life of pediatric patients with moderate to severe plaque psoriasis: Comparisons to four common chronic diseases. *European Journal of Pediatrics, 171*(3), 485–492. https://doi.org/10.1007/s00431-011-1587-2.

Wan, S.-H., Song, P.-L., Feng, J.-H., Xiong, C., & Zhang, X. (2015). The correlation between children quality of life with chronic skin diseases and the emotion of their parents. *Journal of Clinical Dermatology, 44*, 767–769.

Webster-Stratton, C. (1990). Stress: A potential disruptor of parent perceptions and family interactions. *Journal of Clinical Child Psychology, 19*(4), 302–312. https://doi.org/10.1207/s15374424jccp1904_2

Wood, B. L., Miller, B. D., & Lehman, H. K. (2015). Review of family relational stress and pediatric asthma: The value of biopsychosocial systemic models. *Family Process, 54*(2), 376–389. https://doi.org/10.1111/famp.12139

Wong, K. F., Massar, S. A., Chee, M. W., & Lim, J. (2018). Towards an objective measure of mindfulness: Replicating and extending the features of the breath-counting task. *Mindfulness, 9*(5), 1402–1410. https://doi.org/10.1007/s12671-017-0880-1

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.