

An Exploratory Study of Eczema Severity and Quality of Life in Paediatric Atopic Dermatitis Across Ethnic Groups



<https://nationaleczema.org/eczema-pictures/?pg=filters>

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Background


- Atopic dermatitis (AD) significantly impairs Quality of Life (QoL) in children
- Ethnic differences in AD epidemiology and severity have been described internationally
- Limited Australian data examining how ethnicity and phototype influence eczema severity or QoL
- Australia's multicultural population necessitates culturally safe and informed dermatological care


Objective

- To explore if ethnicity or skin phototype predicts
 - Eczema severity
 - QoL
- To identify caregiver concerns and treatment preferences affecting QoL
- **Hypothesis:** Non-Caucasian children and those with darker skin phototypes have higher AD severity and worse QoL impairment

Methods

- **Study Design:** Prospective, multicentre observational study (Nov 2023 – June 2024)
- **Participants:** 147 children (0–16 years) with AD
 - Site 1 (RCH, Melbourne): n=71, New patients only
 - Site 2 (PCH, Perth): n=76, Mixed new and review patients
- **Outcomes:**
 - Eczema Area and Severity Index (EASI)
 - QoL: Infants' and Children's DLQI
 - Caregiver: Demographics, Eczema Concerns Questionnaire (as shown)

 Government of Western Australia
Child and Adolescent Health Service



Exploratory study of key differences in paediatric atopic dermatitis quality of life domains across ethnic groups.

Atopic Dermatitis Impact Questionnaire

Thank you for taking the time to complete this anonymous questionnaire.
Your participation is most valuable.

What is your child's current age? _____ What ethnicity does your child identify as? _____

How many children do you have? (please circle)

1 2 3 4 5 >5

Who else in the family has eczema? _____

Primary caregiver education

	<u>Caregiver 1</u>			<u>Caregiver 2</u>		
Did you complete secondary school?	Yes	No	Unknown	Yes	No	Unknown
Did you complete any further study?	No further study Unknown Certificate/diploma Degree Higher degree			No further study Unknown Certificate/diploma Degree Higher degree		
Are you currently in paid employment?	Yes No			Yes No		

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General questions about your home environment relating to your child's eczema

Do you routinely dress your child in 1, 2 or 3 layers for bed? (Please circle) 1 2 3

Do you use heaters in your child's bedroom during the winter months? (Please circle) Yes No

Do you apply oils on your child's skin? (Please circle) Yes No


If yes, which one(s)? _____

Do you prefer to use a cream or ointment on your child? Creams are white and ointments are clear (like Vaseline) (Please circle)

 Creams Ointments

Do you use any natural or herbal preparations or scrubs on your child's skin? (Please circle) Yes No

Neonatology | Community Health | Mental Health | Perth Children's Hospital



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- **Data Collected:**
 - Clinical Severity: Eczema Area and Severity Index (EASI)
 - Quality of Life: Infants' and Children's DLQI
 - Caregiver: Demographics, Eczema Concerns Questionnaire



If yes, which one(s) _____

How worried are you about the following for your child's eczema? (Please tick)

	Not at all worried	Undecided	Somewhat worried	Very worried
Moisturisers				
Topical steroids				
Medicine to suppress the immune system				
Wet dressings				
Bleach baths				
Allowing your child to play outside and get dirty				
Food allergy				
Environmental allergy				

If yes, to the above question, what worries you?

Is there anything else that worries you about your child's eczema?

What was your main source of information and advice about eczema management before your child was diagnosed with eczema? (e.g. what resources did you refer to and what people did you see first to get help for your child's eczema?)

Who do you go to first for health information? (Please circle one or more where relevant)

Nurses Doctors Family Internet Other _____

By completing this questionnaire, you are helping us collect valuable information relating to your experiences having a child with eczema and are consenting for us to use this de-identified data (i.e. data where all personally identifiable information has been removed).

Please contact Jemma Weidinger, Dermatology Nurse Practitioner on 0436 595 847 or Jemma.Weidinger@health.wa.gov.au if you have any questions.



Results

Demographics

Characteristic	Overall N = 147 ¹	RCH N = 71 ¹	PCH N = 76 ¹	p-value ²
Age (years)	2.0 (0.8, 5.5)	1.9 (0.6, 3.7)	2.4 (0.8, 7.3)	0.13
Sex				0.3
Female	65 (44%)	28 (39%)	37 (49%)	
Male	82 (56%)	43 (61%)	39 (51%)	
Born in Australia	133 (90%)	67 (94%)	66 (87%)	0.12
Ethnicity				0.037
Oceanian	78 (53%)	37 (52%)	41 (54%)	
SE/NE Asian	22 (15%)	6 (8.5%)	16 (21%)	
South Central Asian	22 (15%)	12 (17%)	10 (13%)	
African	5 (3.4%)	1 (1.4%)	4 (5.3%)	
European	10 (6.8%)	7 (9.9%)	3 (3.9%)	
Other/Unknown	10 (6.8%)	8 (11%)	2 (2.6%)	0.5
Mother's ethnicity				
Oceanian	51 (35%)	20 (28%)	31 (41%)	
SE/NE Asian	31 (21%)	14 (20%)	17 (22%)	
South Central Asian	38 (26%)	22 (31%)	16 (21%)	
African	6 (4.1%)	4 (5.6%)	2 (2.6%)	
European	17 (12%)	9 (13%)	8 (11%)	0.3
Other	4 (2.7%)	2 (2.8%)	2 (2.6%)	
Phototype				
1	22 (15%)	11 (15%)	11 (14%)	
2	34 (23%)	11 (15%)	23 (30%)	
3	23 (16%)	12 (17%)	11 (14%)	
4	49 (33%)	27 (38%)	22 (29%)	
5	15 (10%)	7 (9.9%)	8 (11%)	
6	4 (2.7%)	3 (4.2%)	1 (1.3%)	

Characteristic	Overall N = 147 ¹	RCH N = 71 ¹	PCH N = 76 ¹	p-value ²
Phototype	3.00 (2.00, 4.00)	4.00 (2.00, 4.00)	3.00 (2.00, 4.00)	0.2
QoL score	7.0 (4.0, 11.0)	10.0 (6.0, 13.0)	5.0 (2.5, 10.0)	<0.001
EASI Score	5 (2, 11)	5 (2, 12)	4 (1, 11)	0.4
Subj.sev	2.00 (1.00, 3.00)	2.00 (2.00, 3.00)	2.00 (1.00, 2.00)	0.015
Unknown	47	14	33	
Age (years)	2.0 (0.8, 5.5)	1.9 (0.6, 3.7)	2.4 (0.8, 7.3)	0.13

Comparing sites

- Similar median EASI scores
- QoL impairment was greater at RCH (recruited new AD patients only) vs PCH
 - Likely reflecting higher disease burden among newly referred patients yet to have optimised their treatment plan

Results

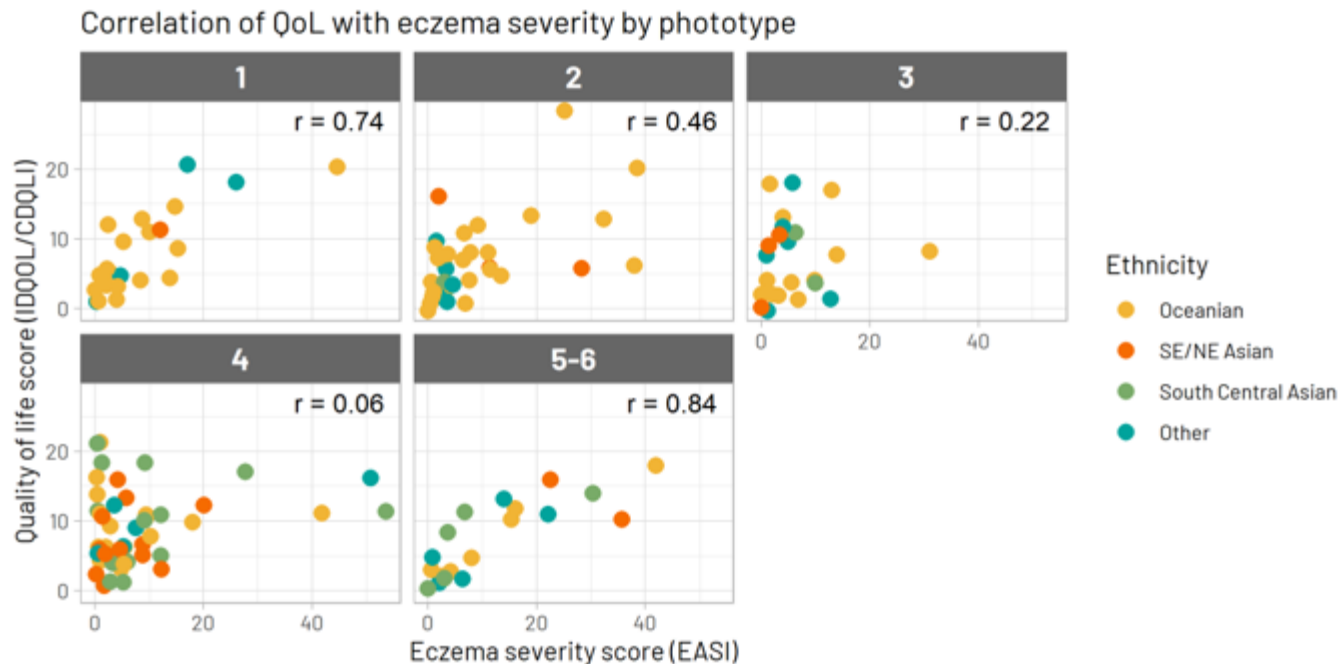
Associations of numeric variables with patient ethnicity

Characteristic	Overall N = 147 ¹	Oceanian N = 78 ¹	SE/NE Asian N = 22 ¹	South Central Asian N = 22 ¹	Other N = 25 ¹	p-value ²
Age (years)	2.0 (0.8, 5.5)	2.4 (0.8, 5.2)	1.9 (0.9, 8.9)	2.0 (0.7, 3.7)	1.4 (0.7, 3.9)	0.4
Phototype	3.00 (2.00, 4.00)	2.00 (2.00, 4.00)	4.00 (3.00, 4.00)	4.00 (4.00, 4.00)	3.00 (2.00, 4.00)	<0.001
QoL score	7.0 (4.0, 11.0)	6.0 (4.0, 11.0)	8.0 (5.0, 11.0)	9.0 (4.0, 11.0)	6.0 (2.0, 12.0)	0.8
EASI Score	5 (2, 11)	5 (2, 11)	4 (1, 12)	6 (3, 10)	5 (2, 8)	>0.9
Subjective severity	2.00 (1.00, 3.00)	2.00 (1.00, 3.00)	2.50 (1.00, 3.00)	2.00 (1.00, 3.00)	2.00 (1.00, 3.00)	>0.9
Unknown	47	26	10	5	6	

- No significant differences were observed across patient-reported ethnic groups for
 - **QoL scores (p=0.8)**
 - **EASI scores (p>0.9)**
- Stratification by maternal ethnicity showed similar results
- Skin phototype was also not associated with severity or QoL outcomes

Results

The association between QoL and EASI appeared reduced for patients with a mid-range phototype, which accords with the lower correlation seen for those reporting an Asian ethnicity.



- **Correlation between EASI and QoL scores was weaker in Asian patients**
 - Objective EASI score does not reliably predict the subjective life impact for this group.
- **Why?**
 - EASI may underestimate inflammation (erythema vs greyscale) in skin of colour
 - QoL may be disproportionately affected by factors that EASI does not measure
 - Post-inflammatory pigmentation
 - Treatment fears (e.g. steroid use)
 - Cultural perceptions of skin appearance

Results

Table 2.					
Associations of QoL impact score (CDLQI/IDQOL) and atopic dermatitis concerns					
Concerns	Y/N	No.	Median QOL	Kruskal-Wallis P-value	Adjusted Linear Model P-value
Moisturisers	No	131	6 (4,11)	0.62	0.59
	Yes	16	8 (5,11)		
Steroids	No	89	7 (3,12)	0.82	0.99
	Yes	58	6 (4,11)		
Immunosuppression	No	96	6 (4,11)	0.29	0.27
	Yes	51	9 (4,12)		
Wet dressings	No	134	6 (3,11)	0.10	0.27
	Yes	13	9 (7,12)		
Bleach baths	No	144	6 (4,11)	0.28	0.44
	Yes	3	11 (10,11)		
Outside play	No	128	6 (4,11)	0.82	>0.99
	Yes	19	8 (4,11)		
Food allergy	No	91	6 (3,11)	0.06	0.01
	Yes	56	8 (5,12)		
Environmental allergy	No	92	6 (3,11)	0.03	0.02
	Yes	55	9 (5,12)		
Number of worries	0	16	4 (3,7)	0.02	0.005
	1-2	94	6 (3,11)		
	3-8	37	9 (6,12)		

Factors associated with higher QoL impairment

- **Specific caregiver concerns correlated with increased disease burden/impact on QoL**
 - Greater number of worries (p=0.005)
 - Concerns about food allergy (p=0.01)
 - Concerns about environmental allergy (p=0.02)
- Preference for ointments over creams (p = 0.01)
- Use of natural/herbal therapies (p = 0.04)

Results

Associations of mother's ethnicity with elements of the home environment or presence of worries

Characteristic	Overall N = 147 ¹	Oceanian N = 51 ¹	SE/NE Asian N = 31 ¹	South Central Asian N = 38 ¹	Other N = 27 ¹	p- value ²
Routinely dress in >1 layer for bed	67 (46%)	22 (43%)	12 (39%)	22 (58%)	11 (41%)	0.4
Bedroom heater in winter	72 (49%)	21 (41%)	17 (55%)	19 (50%)	15 (56%)	0.5
Use of oils	34 (23%)	11 (22%)	8 (26%)	10 (26%)	5 (19%)	0.9
Preferred topical treatment						0.4
Cream	94 (64%)	28 (55%)	21 (68%)	26 (68%)	19 (70%)	
Ointment	53 (36%)	23 (45%)	10 (32%)	12 (32%)	8 (30%)	
Use of natural/herbal preparations	16 (11%)	7 (14%)	3 (9.7%)	4 (11%)	2 (7.4%)	0.9
Cause for worry:						
Moisturisers	16 (11%)	6 (12%)	4 (13%)	3 (7.9%)	3 (11%)	>0.9
Steroids	58 (39%)	16 (31%)	13 (42%)	15 (39%)	14 (52%)	0.4
Immunosuppression	51 (35%)	20 (39%)	5 (16%)	12 (32%)	14 (52%)	0.029
Wet dressings	13 (8.8%)	5 (9.8%)	2 (6.5%)	3 (7.9%)	3 (11%)	>0.9
Bleach baths	3 (2.0%)	0 (0%)	0 (0%)	1 (2.6%)	2 (7.4%)	0.10
Outside play	19 (13%)	7 (14%)	4 (13%)	3 (7.9%)	5 (19%)	0.6
Food allergy	56 (38%)	17 (33%)	16 (52%)	12 (32%)	11 (41%)	0.3
Environment	55 (37%)	17 (33%)	17 (55%)	11 (29%)	10 (37%)	0.15
Number of worries						0.2
0	16 (11%)	8 (16%)	2 (6.5%)	5 (13%)	1 (3.7%)	
1-2	94 (64%)	31 (61%)	20 (65%)	28 (74%)	15 (56%)	
3-8	37 (25%)	12 (24%)	9 (29%)	5 (13%)	11 (41%)	

Immunosuppression was a more common concern among caregivers of **Oceanian and South-Central Asian background**

Discussion & Limitations

- 1) **Ethnicity** and phototype were **not associated with disease severity or QoL burden** in these two Australian centres
- 2) Cultural perceptions and parental concerns have influence on perceived AD burden
 - **Specific parental concerns such as food and environmental allergies** were also linked to greater perceived burden
- 3) In individuals with skin of colour, EASI may underestimate disease severity due to challenges in assessing erythema on darker skin tones
 - QoL may be affected by other factors not reflected in EASI scoring

Limitations:

- Modest sample size & cross-sectional design
- Recruitment differences were insightful but limit direct site-to-site comparisons

Conclusion

- **Ethnicity and phototype do not independently predict eczema severity or QoL** in these two centres
- However, **cultural factors**, including treatment preferences and caregiver concerns are **strongly associated with the perceived disease burden**
- These findings highlight the importance of
 - **Culturally responsive care**
 - **Addressing parental concerns** in the management of paediatric AD (e.g. steroid use and immunosuppression)
 - Better severity assessment tools for patients with skin of colour