



# A Study To Estimate The Prevalence And Identify The Relationship Between Breastfeeding And Development Of Pediatric Atopic Dermatitis In The Rural Community Of North India

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## Abstract

Atopic dermatitis (AD), also known as eczema, is a common chronic inflammatory skin disorder that affects both children and adults worldwide. The etiology of AD is multifactorial, involving complex interactions between genetic, immunological, and environmental factors. In recent years, there has been growing interest in exploring the potential impact of breastfeeding on the development and management of AD. In this study we aims to provide prevalence regarding the relationship between breastfeeding and atopic dermatitis, including its preventive and therapeutic aspects.

**Keywords:** Atopic dermatitis, breastfeeding, eczema, immune system, prevention, management.

## Introduction

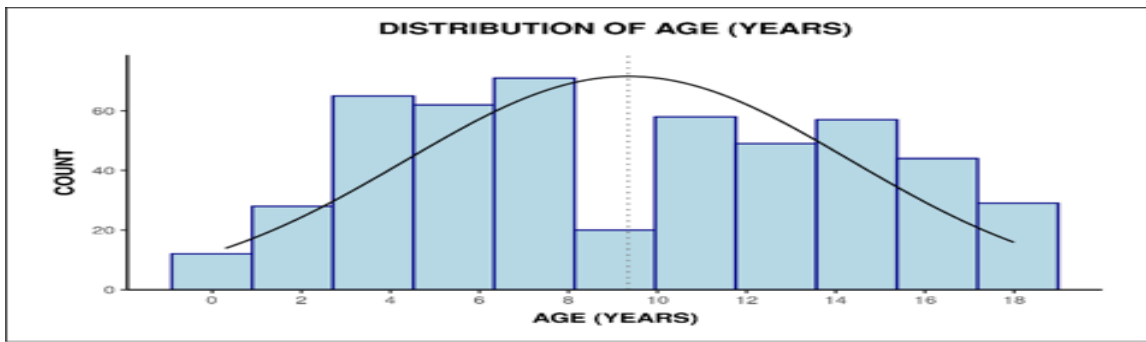
Atopic dermatitis is characterized by intense itching, dry skin, erythema, and a relapsing course. Its prevalence has been steadily increasing, particularly in developed countries, and it imposes a significant burden on patients and healthcare systems. Breastfeeding, known for its numerous benefits, has been suggested to play a protective role in the development and severity of AD.

## Material and Method

A questionnaire based cross-sectional study was conducted in the rural community in which we recruited children from birth to 18 years at Fatehgarh Sahib district in Punjab beginning from January 1, 2019 to December 31, 2019 after obtaining approval from the Institutional Ethics Committee The questionnaire included maternal risk factor variables (presence of atopic dermatitis, asthma or atopy in mother) and child dependent variables:breastfeeding or not. Information was collected on whether the participants were breastfed as infants, the duration of breastfeeding, and any other relevant breastfeeding-related factors.

## Result

A total of 495 study subjects were interviewed for the study. The median (IQR) of age (years) was 9.00 (9.00; range - 0.3- 18). Of 495 participants, 254 (51.3%) were boys and 241 (48.7%) were girls. Sixteen (3.2%) children were infants, 118 (23.8%) were in 1-5 years, and 361 (72.9%) were >5 years of age. The mean number of family members was  $5 \pm (2)$ .



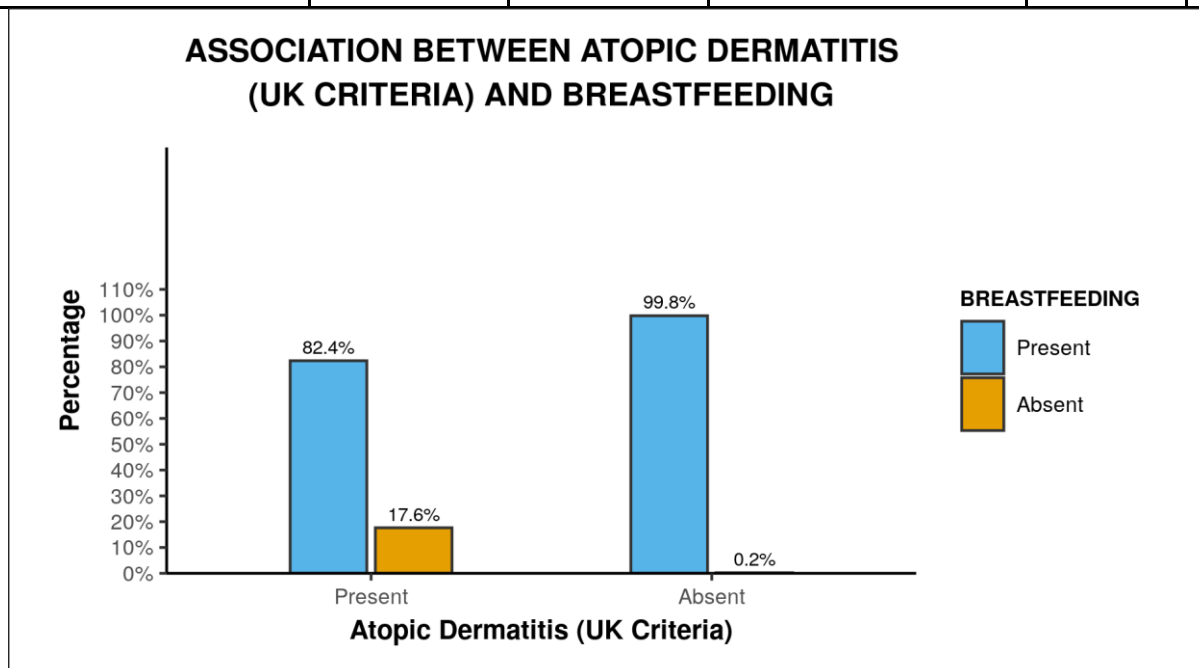
Fisher's exact test was used to explore the association between 'Atopic Dermatitis (UK Criteria)' and 'Breastfeeding' as more than 20% of the total number of cells had an expected count of less than 5.

82.4% of the participants in the group Atopic Dermatitis (UK Criteria): Present had Breastfeeding: Present. 17.6% of the participants in the group Atopic Dermatitis (UK Criteria): Present had Breastfeeding: Absent. 99.8% of the participants in the group Atopic Dermatitis (UK Criteria): Absent had Breastfeeding: Present. 0.2% of the participants in the group Atopic Dermatitis (UK Criteria): Absent had Breastfeeding: Absent.

There was a significant difference between the various groups in terms of distribution of Breastfeeding ( $\chi^2 = 62.277, p = <0.001$ ).

Participants in the group Atopic Dermatitis (UK Criteria): Absent had the larger proportion of Breastfeeding: Present. Participants in the group Atopic Dermatitis (UK Criteria): Present had the larger proportion of Breastfeeding: Absent.

Breastfeeding	Atopic Dermatitis (UK Criteria)			Fisher's Exact Test	
	Present	Absent	Total	X <sup>2</sup>	P Value
Present	14 (82.4%)	477 (99.8%)	491 (99.2%)	62.277	<0.001
Absent	3 (17.6%)	1 (0.2%)	4 (0.8%)		
Total	17 (100.0%)	478 (100.0%)	495 (100.0%)		



The statistical analysis was performed to assess the relationship between atopic dermatitis and breastfeeding using univariable and multi variable regression analysis (Table 2). The model was evaluated based on an alpha of 0.05. The overall model was significant,  $\chi^2(8) = 121.60, p < .001$ . McFadden's R-squared was calculated to

examine the model fit, where values greater than 0.2 are indicative of models with excellent fit. The McFadden R-squared value calculated for this model was 0.82.

Table-2: Univariable and Multivariable analysis of the risk factors with significant p- value

Dependent: atopic_dermatitis_uk_criteria		Absent	Present	OR (univariable)
Breastfeeding	Absent	1 (25.0)	3 (75.0)	-
	Present	477 (97.1)	14 (2.9)	0.01 (0.00-0.08) p<0.001)
<b>MODEL FIT: <math>\chi^2(8) = 121.6</math>, <math>p = &lt;0.001</math> Pseudo-<math>R^2 = 0.82</math> Number in dataframe = 495, Number in model = 49 = 0.965, H&amp;L = Chi-sq(8) 15.95 (p=0.043)</b>				

## Discussion

Breast milk contains a variety of bioactive components that modulate the immune system and contribute to the development of a balanced immune response. Immunoglobulins, such as secretory IgA and IgG, cytokines, growth factors, and various immune cells present in breast milk, have been shown to promote immune tolerance, enhance the gut barrier function, and modulate the gut microbiota, all of which are thought to influence the development and course of AD. Epidemiological studies have consistently demonstrated a reduced risk of AD in breastfed infants compared to those who were formula-fed. Exclusive breastfeeding for at least four to six months has been associated with a lower incidence of AD. The protective effect of breastfeeding may be attributed to the transfer of maternal immune factors, the establishment of a healthy gut microbiota, and the avoidance of potential allergens present in infant formula. Breastfeeding has been reported to impact the severity and clinical course of AD in affected infants. Studies have shown that prolonged breastfeeding and continued exposure to breast milk can lead to milder symptoms, decreased frequency of exacerbations, and a reduced need for topical or systemic medications. Additionally, breastfeeding during the introduction of complementary foods has been associated with a lower risk of developing food allergies, which often coexist with AD. Many advocate breastfeeding as a way of preventing allergies, including AE. For instance, the World Health Organization (WHO) recommends that infants are exclusively breastfed for 6 months, and most European ministries of health advocate at least 4 months of exclusive breastfeeding to aid allergy prevention. In rural community, in our study area most mothers exclusively breastfed their baby for at least 6 months ; mostly for more than 2 years. This may be due to increased social awareness by Accredited Social Health Activist (ASHA) and multipurpose workers about the benefits of breastfeeding. In our study, we found significant correlation between AD and breastfeeding in atopic (84%) and non-atopic group (99%) .On univariable analysis breastfeeding found to be a protective factor ( CI 0.00-0.08, p<0.001); and may be reason for overall low prevalence in rural community. The role of breast-feeding on AD has been controversial and majority has reported that breast feeding does not significantly influence the development of eczema. However, the custom of prolonged breast feeding in India could have influenced the milder severity of AD in Sarkar and Kanwar's patients.<sup>13</sup> Factors such as maternal diet, breastfeeding duration, exclusive breastfeeding, and the presence of other confounding variables can influence the outcomes. Moreover, there may be individual variations in the response to breastfeeding in different populations.

## Conclusion

Breastfeeding plays a significant role in the prevention and management of atopic dermatitis. However, It's important to note that cross-sectional studies can only establish an association between variables, not causality. Other study designs, such as longitudinal studies or randomized controlled trials, would be needed to establish a cause-and-effect relationship between atopic dermatitis and breastfeeding. further research is needed to better understand the optimal duration and exclusivity of breastfeeding, as well as the potential interactions with other factors, to optimize its benefits in AD prevention and management.