



## Prevalence of atopic dermatitis in Iranian children: A systematic review and meta-analysis

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### Abstract

**Objective:** the aim of this systematic review and meta-analysis was to evaluate the prevalence of atopic dermatitis in Iranian children.

**Methods:** The present systematic study has applied developed methods that are in line with accurate instruction of PRISMA checklist. Two researchers have separately investigated all studies conducted up to May 2019; the studies had been collected from international databases (PubMed, Google Scholar, and WOS) and national ones (SID and Magiran) without any time limitation in both English and Persian. The keywords applied in the research strategy include: Atopic dermatitis, Risk factors, Children, and Iran that were combined with Boolean operators such as AND, OR, and NOT.

**Results:** As many as seven studies conducted on 8590 children were included in this meta-analysis. In asymptomatic children, according to the results of random effects mode, the general prevalence of atopic dermatitis was 4.9% in 8590 children (95% CI: 4.5, 5.3;  $I^2=98.5\%$ ).

**Conclusion:** Given the findings of the present study, the relatively high prevalence of AD, and the relationship between factors including smoking, keeping pets at home, etc. and the disease prevalence, it is highly recommended to put due emphasis on training parents, especially mothers, in terms of predisposing factors of AD.

**Keywords:** Atopic dermatitis, Risk factors, Children

### Introduction

Atopic dermatitis is the most common skin condition. The most common type of atopic dermatitis in children is diaper dermatitis (1). This topical disease involves the part of skin covered with diaper (2). This disease is also observed in the elderly suffering from urinary incontinence as well as kids and adults suffering from urinary incontinence due to Hirschsprung's disease or urinary anomalies (3).

Physical and mental pressures and the harms arising from this disease affect both the patient and his/her family (4). Although the severity of the disease

reduces and there will be decreased skin lesion at late childhood, in many chronic dry cases, itching and occupational dermatitis of hands continue to exist. These permanent manifestations can affect the patient's lifestyle and his/her relationships as well (5).

In terms of clinical symptoms, it is manifested as erythematous dermatitis and papulovesicular on lower abdomen, genitalia, convex section of the buttock, thighs and sometimes calves without involving the wrinkles (6). In severe cases, surface wounds are created and the inflammation of the head of the penis results in frequent urination, urinary retention, and the emergence of blood drops on the diaper (7).

Etiologically speaking, not all disease cases seem to be resulted from a single group of causes, but its occurrence is very remote without diaper and degrees of urinary and fecal incontinence (8). The factors that are required to be taken into account in its etiology include moisture of skin, long-term closure of skin pores, abrasion, remaining effects of soap in diaper, presence of urine resulting in increased skin permeability, high pH causing increased activities of proteolytic and lipolytic enzymes of feces and the presence of feces (9).

Since the prevention and treatment of every disease calls for identifying the prevalence and predisposing factors of the disease in a given community, the present study was conducted to identify the prevalence of this disease among the Iranian children.

## Materials and Methods

The present systematic study has applied developed methods that are in line with accurate instruction of PRISMA checklist. However, only observational studies including letters to the editors, journals, poor quality articles (based on HOY tool). It was attempted to include studies only in English and Persian. All observational studies with any sampling and statistical designs have been included in the present systematic study. Two researchers have separately investigated all studies conducted up to May 2019; the studies had been collected from international databases (PubMed, Google Scholar, and WOS) and national ones (SID and Magiran) without any time limitation in both English and Persian. The reference list of the existing studies has been also investigated to find more studies in this regard. Special research strategies have been adopted by a health science librarian (an expert on

systematic studies) through applying MESH browsing vocabulary as well as free vocabulary based on PRESS standard (16). Moreover, MEDLINE research strategy has been applied for searching other databases as well. The keywords applied in the research strategy include: Atopic dermatitis, Risk factors, Children, and Iran that were combined with Boolean operators such as AND, OR, and NOT. Two researchers have separately investigated the titles and abstracts by considering the qualification criteria. After excluding the repetitive studies, the full texts of the studies were investigated based on the qualification criteria and the required information was extracted. For solving the questions on qualifications, extra information was obtained from the authors whenever needed. Moreover, the required data on conditions, sample size, risk of bias, and the measurement of result (prevalence of atopic dermatitis) were collected as well. The final extracted data were evaluated by using STAT 14.0.

## Results

**Study selection:** In total, as many as 242 studies were selected from the initial research on PubMed, Google Scholar, SID, Magiran, and Web of Science from the beginning to May 1 of 2019. From 242 non-repetitive studies (in terms of title and abstract), as many as 211 studies were excluded in the screening process; their titles were unrelated. From the remaining 31 studies, 7 studies were qualified for having the required criteria. From 24 excluded studies, 6 studies were reviewed, 5 studies were sent to the editor in chief (letter to editor), five studies didn't have the full texts, and 8 studies didn't meet the minimum quality and standards required to be included in this study (Figure 1).

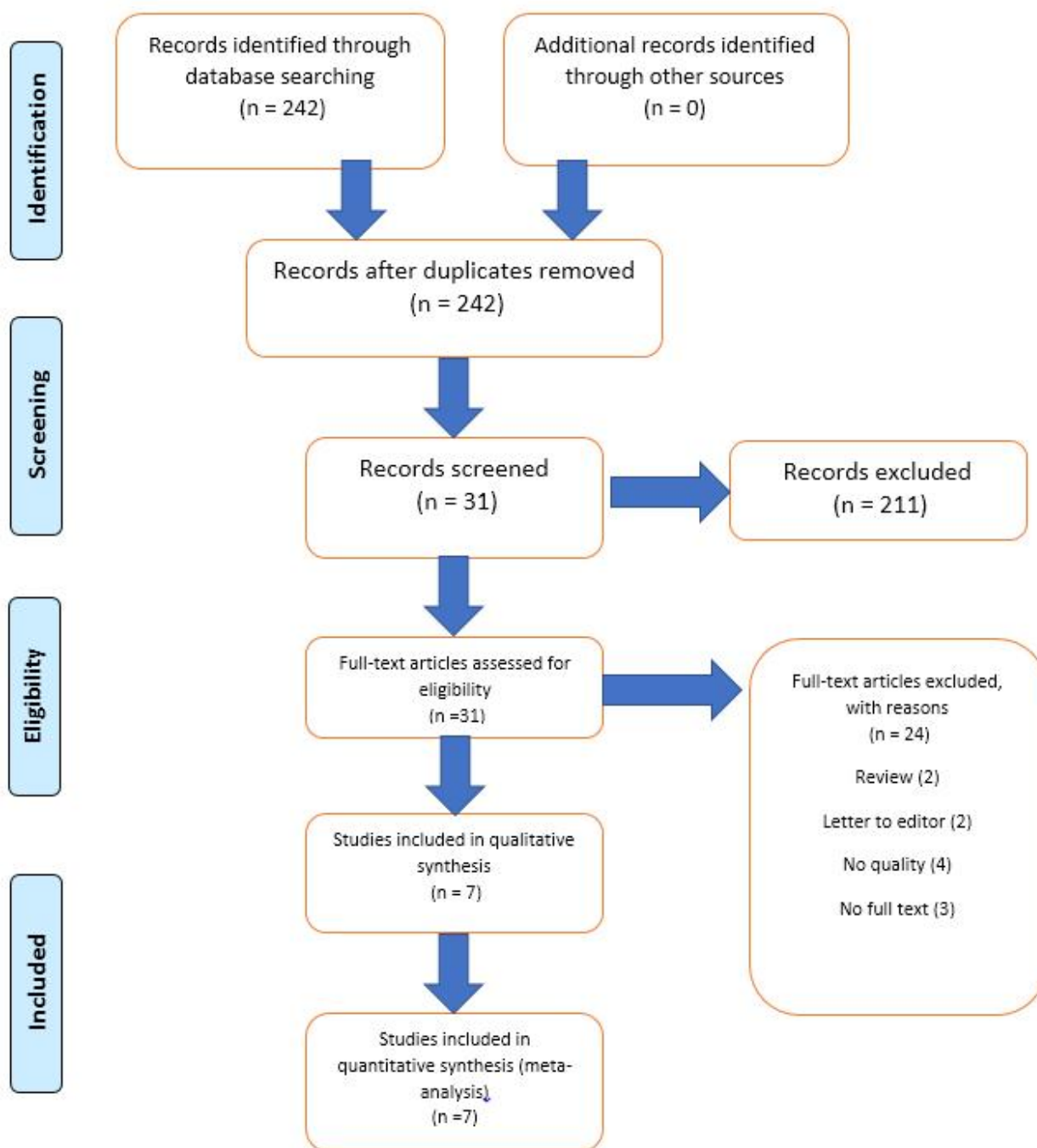


Fig 1. PRISMA flow diagram

### Research characteristics:

These 7 studies had been conducted on 8590 Iranian children aged <14 years. From these 7 studies, 6 studies have provided cross-sectional data, and one study was a prospective research. From these 7 studies, two studies belonged to Birjand. Moreover, each of

Boushehr, Ahvaz, Bandarabbs and Hamadan provinces accounted for one study. The most common sampling method applied was convenience sampling method (n=6). More than 80% of the studies had low risk of bias. Hospital was the most prevalent place for conducting the studies (n=7).

# Prevalence of atopic dermatitis in Iranian children

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children, according to the results of random effects mode, the general prevalence of atopic dermatitis was 4.9% in 8590 children (95% CI: 4.5, 5.3;  $I^2=98.5\%$ ) [Table 1].

Table 1: Characteristics of final included studies

Author	year	participants	province	ES	95% conf .Interval		weight	Bias
					low	Up		
Farrokhi <sup>(16)</sup>	2012	2395	Boushehr	0.156	0.141	0.171	8.55	Low
Mousavi <sup>(17)</sup>	2006	2500	Ahvaz	0.039	0.031	0.047	31.35	Low
Mohammadi <sup>(18)</sup>	2008	900	Bandarabbas	0.054	0.039	0.069	8.28	Low
Peyrovi <sup>(19)</sup>	2010	810	Birjand	0.031	0.019	0.043	12.53	Low
Afshari <sup>(20)</sup>	2006	1500	Shahrkord	0.021	0.014	0.028	34.29	Low
Ghaderi <sup>(21)</sup>	2008	100	Birjand	0.143	0.121	0.165	3.88	Low
Emdadi <sup>(22)</sup>	2002	385	Hamadan	0.205	0.165	0.245	1.12	Moderate
Pooled ES	---	8590	-----	0.049	0.045	0.053	100	-----

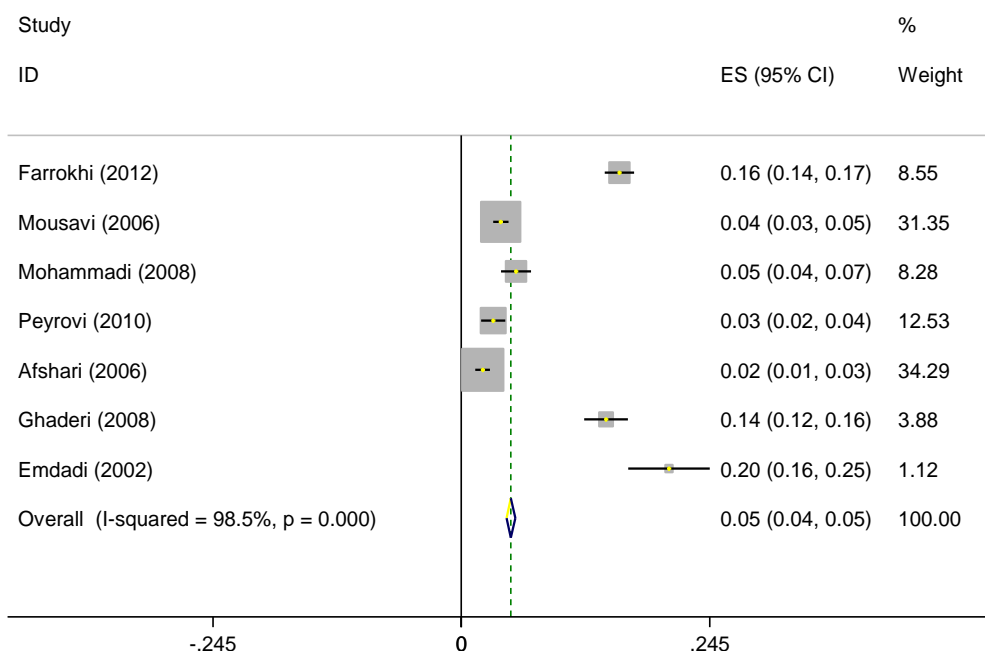


Fig. 2 :The prevalence of atopic dermatitis among Iranian children and its 95% Interval for the studied cases according to the year and the city where the study Was conducted based on the model of the random effects model. The midpoint Of each section of the line estimates the% value and the length of the lines Showing the 95% confidence interval in each study.

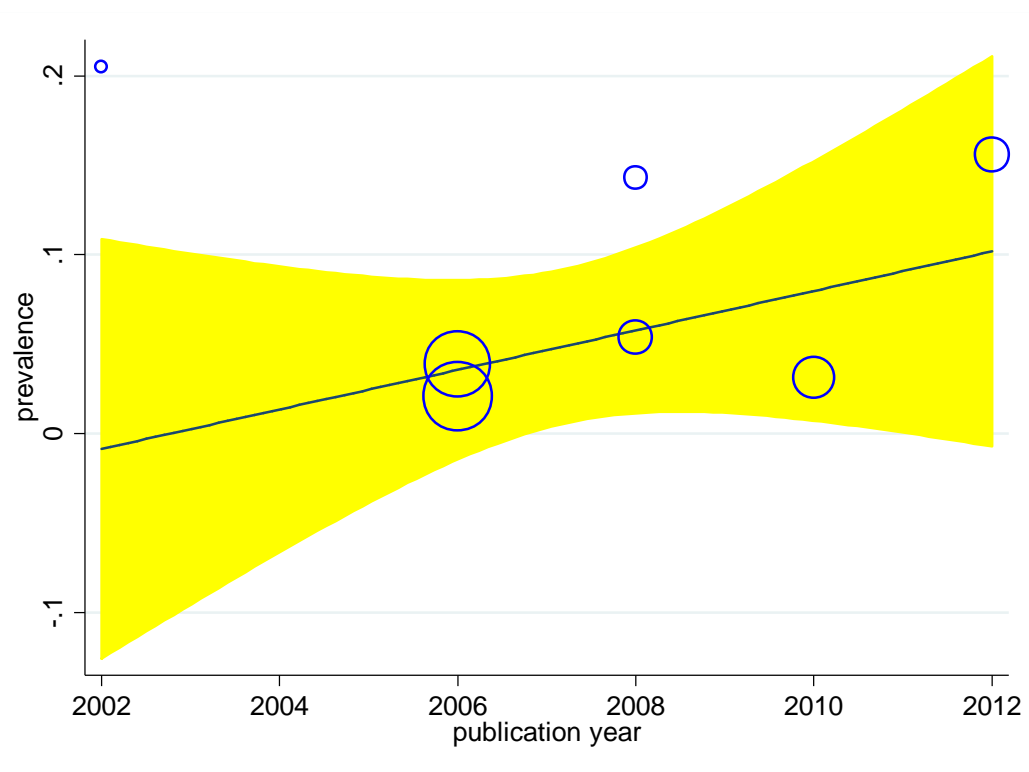


Fig. 2 Meta-regression between publication year of study and prevalence of atopic dermatitis among Iranian children

## Discussion

As many as seven studies conducted on 8590 children were included in the meta-analysis. In asymptomatic children, according to the results of random effects mode, the general prevalence of atopic dermatitis was 4.9% in 8590 children (95% CI: 4.5, 5.3;  $I^2=98.5\%$ ). According to recent studies, the direct economic losses of atopic dermatitis (AD) have been significantly high in England, Australia, and the United States (10). According to a study conducted in the Netherlands and comparing the findings with some European countries, the costs of AD are extremely high (11). However, the costs of individual care have been reported to be very low. The data obtained from other parts of the world indicate the increase prevalence of AD after the World War II (12). It is commonly assumed that this increase is owing to changes occurring in our living environments. Clinically speaking, AD cutaneous manifestations are divided into three phases i.e. infancy, childhood, and adolescence; each phase has its own age range and manifestations. However, the onset of the disease can start at any age (13). More than two thirds of the

disease onsets belong to the first year of the infant's life, and in 85% of the cases, lesions occur up to the age of five (14). AD can affect the children's social adaptation and their educational achievements as well. In addition, AD is regarded as a serious financial issue for the patient's family and the national health system (15). AD can also bring about disorders in the person's physical performance and mental health in comparison to normal people. In comparison to individuals suffering from diabetes or hypertension, AD patients have lower mental health scores. Thus, investigating the prevalence of AD will be of high significance for adopting healthcare policies.

## Conclusion

Given the findings of the present study, the relatively high prevalence of AD, and the relationship between factors including smoking, keeping pets at home, etc. and the disease prevalence, it is highly recommended to put due emphasis on training parents, especially mothers, in terms of predisposing factors of AD.

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