Pediatric Dermatology

WILEY

Pediatric Dermatology

ORIGINAL ARTICLE OPEN ACCESS

Systematic Review of the Prevalence of Tinea Pedis in Children

Joanna Elisabeth Bjerg Stenderup[1] | Noor Fatima Goandal[1] | Ditte Marie Lindhardt Saunte[1,2,3]

[1]Department of Dermatology, Zealand University Hospital, Roskilde, Denmark | [2]Department of Clinical Medicine, Faculty of Medical and Health Sciences, University of Copenhagen, Copenhagen, Denmark | [3]Department of Allergy and Dermatology, Herlev and Gentofte University Hospital, Gentofte, Denmark

Correspondence: Ditte Marie Lindhardt Saunte (ditte.marie.saunte@regionh.dk)

Received: 22 December 2024 | **Revised:** 27 February 2025 | **Accepted:** 23 March 2025

Funding: The authors received no specific funding for this work.

Keywords: athlete's foot | children | dermatophytosis | pediatric | pedis | tinea

ABSTRACT

Background/Objectives: Tinea pedis, commonly known as athlete's foot, is a fungal infection that affects the skin of the feet. While there is extensive research on the prevalence of tinea pedis in adults, data regarding prevalence in children are limited. Therefore, it is important to gain information about epidemiology and prevalence in pediatric patients to prevent and treat this condition in children.

Methods: A comprehensive search across PubMed and Embase was conducted for studies published up to October 10, 2024. Inclusion criteria were studies reporting on the prevalence of tinea pedis in children (0–19 years) with a study population of a minimum of 100 children. A total of 29 studies met the inclusion criteria and were analyzed to determine prevalence patterns, diagnostic methods, and etiological agents.

Results: The included studies revealed prevalence rates varying from 0.03% to 15.6%. The most common diagnostic methods were clinical examination, microscopy, and culture. The main etiological agents were dermatophytes, specifically *Trichophyton rubrum*.

Conclusions: This systematic review reveals heterogeneous studies with variations among countries when reporting the prevalence of tinea pedis in children of up to 15.6%. Healthcare professionals should increase awareness of recognizing tinea pedis and consider it a potential diagnosis within the pediatric population.

1 | Introduction

Tinea pedis, commonly known as athlete's foot, is a superficial fungal infection primarily caused by the dermatophyte *Trichophyton (T.) rubrum* [1–3]. While it predominantly affects adults, its prevalence in children is not negligible [1, 4]. Since the 1960s, an increase in pediatric tinea pedis in Israel has been reported [5], with a similar recent trend observed for onychomycosis among children [6]. The prevalence of pediatric onychomycosis has been reported to be 0%–7.66%, with a slight increase from 1972 to 2014 [6]. Given the perception that tinea pedis is less common in children [4], understanding its prevalence and identifying age-related trends is crucial for early detection and management to prevent disease progression and transmission [2].

Treatment includes topical antifungal agents, such as terbinafine cream, which is the first-line treatment [5] and is well tolerated in children aged > 2 years [7]. In more severe cases, oral antifungal treatment can be necessary [8]. Preventative measures include keeping the feet dry and avoiding the sharing of footwear [1, 2].

The aim of this systematic review is to assess the global prevalence of tinea pedis in the pediatric population. Additionally, it seeks to highlight the epidemiological aspect of tinea pedis in a potentially overlooked demographic, thereby raising awareness among healthcare professionals and parents about the importance of recognizing, preventing, and treating this condition in children.

2 | Methods

This systematic review assesses the prevalence of tinea pedis among children (0–19 years), following the PRISMA guidelines [9]. The review was registered in the PROSPERO registry on April 5, 2024, with the registration number CRD42024532638.

A literature search was conducted using a search string (Appendix A) in the databases PubMed and Embase (OVID) on October 7 and October 10, 2024. The database DOAJ was also searched on October 7, 2024, but no relevant findings were obtained. The reference lists of the included articles were reviewed to identify additional relevant literature, and one article was included. The literature screening process was done independently by two authors, JBS and NFG, utilizing the Rayyan screening tool (AI tool) [10]. No other AI tool has been used. In the event of any disparities in selection, the senior author DMS was consulted to reach a consensus.

2.1 | Inclusion Criteria

The inclusion criteria were studies published in peer-reviewed journals, written in English, and reporting on the prevalence of tinea pedis in at least 100 children up to and including 19 years old.

2.2 | Exclusion Criteria

The exclusion criteria were studies with a population having or suspected of tinea pedis, specific patient groups (e.g., diabetes or immunodeficiencies), studies focusing on specific etiological agents, and reviews.

2.3 | Data Collection and Statistic

Data regarding the prevalence of tinea pedis (author, year of publication, country where the study was conducted, study duration, population size, diagnostic procedures, etiological agents, accompanying fungal or skin disorders) were gathered by one author, JBS, and entered in an Excel spreadsheet. Narrative synthesis was used due to data heterogeneity, describing prevalence variations based on study designs, age, location, and other factors. A linear regression model was applied to the data to assess the correlation between the prevalence of tinea pedis in children (%) over time (year of publication). Excel Version 16.84 (24041420) was used to determine if the variation in prevalence had changed over time by adding a trend line and calculating the *p*-value and 95% confidence interval. A meta-analysis was not possible due to differences in study population, design, age, and diagnostic methods.

3 | Results

3.1 | Literature Search

The search across PubMed and Embase yielded a total of 862 articles, and 29 articles were included. The literature screening process and selection of articles is illustrated in a PRISMA flow diagram [9] (Figure 1).

3.2 | Demographic Data

The size of the study population ranged from 321 to 8122 children, where most of the children were 7 to 14 years old, and the mean age was 12.6 years (±6.5). The lowest percentage of males was 38.3% [11], while the highest was 66.9% [12]. Two studies provided data only on males [13, 14]. The mean percentage of male children was approximately 52.6% (Table 1). Seven studies found that boys are more likely to have tinea pedis compared to girls [4, 15–20], while two studies reported the opposite [21, 22].

3.3 | Recruitment and Examination of Study Population

Most of the studies included were cross-sectional studies focusing on school children (25/29, 86%) (Table 1). A quarter of the studies (7/29, 24%) randomly selected participants and differentiated them based on rural vs. urban settings [18, 19, 23–27] or socioeconomic status [15, 28]. Two studies were conducted at male boarding schools [13, 14] (Table 1). Most clinical examiners were dermatologists (9/29, 31%) [13–15, 17, 19, 22–25], while others were nurses (3/29, 10%) [4, 11, 29], specially trained teachers (1/29, 3%) [11], a microbiologist (1/29, 3%) [21], nondermatologist physicians (2/29, 6%) [21, 26], an Assistant Medical Officer of Health [16] (1/29, 3%), or pediatricians (2/29, 6%) [18, 21]. The rest of the studies (10/29, 34%) did not specify the examiners.

Of the four studies conducted outside schools, one was from orphanage centers in Tanzania [12], two were from dermatology clinics in Colombia and Sri Lanka [30, 31], and one investigated children visiting a public swimming pool carried out in Scotland [32] (Table 1).

3.4 | Diagnostics

All studies included a visual examination of each child for clinical signs compatible with tinea pedis (e.g., desquamation, scaling, fissures, redness, grooves) [1]. The majority of the studies used microscopy and culture for mycological confirmation of the clinical diagnosis (21/29, 72.4%), with a prevalence ranging from 0.25% to 15.6% [4, 16–18, 20, 21, 26–38] (Table 1). One study used a combination of clinical examination and microscopy, resulting in a prevalence of 5.5% [11]. Seven studies estimated the prevalence based on clinical examination only, which varied from 0.03% to 8.7% [12, 14, 19, 22, 23, 25, 26]. Of the studies that relied on clinical examination only, the lowest prevalence was found in Egypt (0.03%) [25], and the highest in Ethiopia (8.70%) [22] (Table 1).

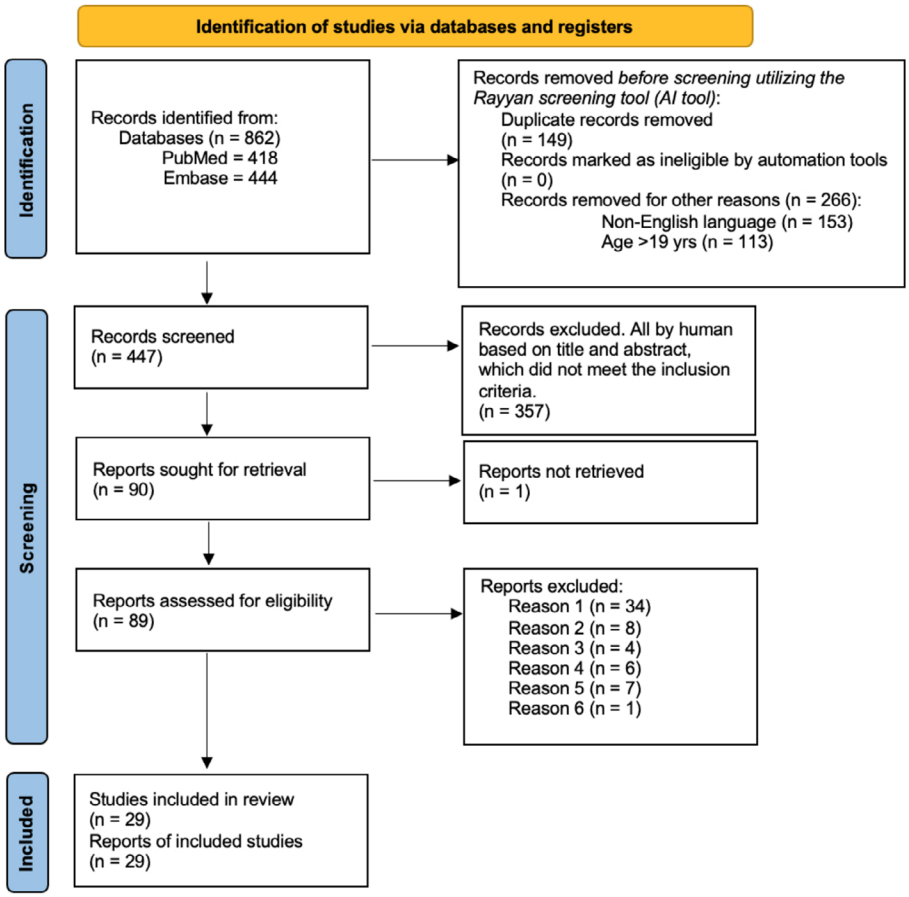

FIGURE 1 | PRISMA Flow Diagram [9]. Reason 1: Whole study population had or was suspected of having tinea pedis. Reason 2: Wrong population (> 19 years). Reason 3: Not enough children (< 100). Reason 4: Wrong publication type (review or case report). Reason 5: Wrong outcome. Reason 6: Foreign language (not English).

3.5 | Distribution Over Time

Figure 2 shows a timeline of the prevalence of tinea pedis in children. The data originates from the included studies, which used the same diagnostic method of clinical examination, microscopy, and culture [4, 16–18, 20, 21, 26–38]. The studies were published between 1959 and 2018, with prevalence rates showing an increase from 3.6% [16] to 6.0% [30]. The highest prevalence rates appear in studies published post-2000. Data from earlier periods show a more consistent prevalence of ~4% (Figure 2).

3.6 | Geographical Distribution

The studies included covered Europe (Denmark [37], Spain [4, 29], England [16], Scotland [32]), Asia (Turkey [13, 18, 36], Israel [15], India [23], Sri Lanka [31], Taiwan [19], Philipines [20]), the Middle East (Iraq [24], Saudi Arabia [14]), Africa (Egypt [25], Ethiopia [22], Mali [26], Nigeria [11, 27, 28, 33], Tanzania [12, 34, 38]), South America (Colombia [30], Peru [35]) and Australia [17] (Figure 3). The prevalence of tinea pedis in these studies ranged from 0.25% to 15.6% [4, 16–18, 20, 21, 26–38]. The highest prevalence of tinea pedis in children was 15.6% and was observed in a male boarding school in Turkey [13]. This result was high compared to other studies using the same diagnostic methods (clinical examination, microscopy, and culture) which varied from 0.25% to 6.90% [4, 16–18, 20, 21, 26–38]. In total, four studies were conducted in Turkey, which revealed notable variations in prevalence despite the same diagnostic methods: 0.27%, 2.1%, 3.3%, 15.6% [13, 18, 21, 36]. The mean percentage of countries belonging to the same continent and using the same diagnostic method was as follows: Europe [4, 16, 29, 32, 37] 3.32% (SD ±0.0059, 2.5%–3.9%), Asia [13, 15, 18–20, 23, 31, 36] 4.11% (SD ±0.0560, 0.27%–15.6%), the Middle East [14, 24] 1.0% (SD ±0.0127, 0.10%–1.90%), Africa [11, 12, 22, 25–28, 33, 34, 38] 2.79% (SD ±0.0152, 0.83%–5.5%), South America [30, 35] 6.35% (SD ±0.0049, 6%–6.7%), and Australia [17] 5.20%.

3.7 | Tinea Pedis With Concomitant Mycotic Infections

Concomitant onychomycosis was reported in six studies [4, 15, 18, 21, 22, 29]. Concomitant tinea capitis was found in a study from Barcelona [29], while a study from Taiwan [19] found eight children with concomitant tinea versicolor.

3.8 | Fungal Pathogens

Dermatophytes (719/750; 96%), particularly *Trichophyton rubrum*, were the most common etiological agent (383/719; 53%).

TABLE 1 | Studies on the prevalence of pediatric tinea pedis (incl. both dermatophyte and yeast infections).

References	Country (locality)	Publication year	Study cohort	Total number of children (*n*)	Male % of total children	Age range in years	Diagnostic method	Prevalance (number of cases/total)	Etiological agents (%, *n*)
23	India (Meerut)	2020	Secondary schools	400	53.0%	13–15	Cl	0.25%[a] (1/400)	N/A
24	Iraq (Heet)	2020	Primary and intermediary schools	2971	56.0%	6–14 (mean 10.2 ± 2.7)	Cl[b]	0.10% (3/2971)	N/A
12	Tanzania (Dar es Salaam)	2020	Orphanage centers	420	66.9%	0–18 (mean 11 ± 3.7)	Cl[b]	0.48%[a] (2/420)	N/A
30	Colombia (Bogotá)	2018	Dermatology referral center	1221	N/A	0–18	Cl + M + C	6.00%[a] (74/1221)	*T. rubrum* (50%, 37) *T. mentagrophytes* (41.9%, 31) *E. floccosum* (2.7%, 2) *T. mentagrophytes* + *E. floccosum* (1.4%, 1) *T. rubrum* + *M. canis* (2.7%, 2) *T. rubrum* + *T. mentagrophytes* (1.4%, 1)
11	Nigeria (Ndi Uduma Awoke)	2015	Primary school	400	38.3%	6–12 (mean 9.43 ± 2.35)	Cl + M	5.50% (22/400)	N/A
22	Ethiopia (Oromya)	2015	School	647	50.9%	4–15 (mean 10.0 ± 2.4)	Cl	8.70% (56/647)	N/A
18	Turkey (Kayseri)	2014	Elementary school	8122	49.6%	5–16 (mean 10.61 ± 2.41)	Cl + M + C	0.27% (22/8122)	*T. rubrum* (36.3%, 8) *T. mentagrophytes* (15%, 1) *Rhodotorula* (36.3%, 8) *Trichosporon* (9.1%, 2) *C. glabrata* (9.1%, 2) *C. albicans* (4.5%, 1)
25	Egypt (Damietta)	2013	Primary school	6162	44.8%	6–12	Cl	0.03% (2/6162)	N/A
26	Mali (Sirakoro)	2011	Schools	390	N/A	6–15 (mean 9)	Cl + M + C	2.80%[a] (11/390)	N/A

(Continues)

TABLE 1 | (Continued)

References	Country (locality)	Publication year	Study cohort	Total number of children (*n*)	Male % of total children	Age range in years	Diagnostic method	Prevalance (number of cases/total)	Etiological agents (%, *n*)
33	Nigeria (Oke-Oyi)	2011	School	602	66.0%	5–16	Cl + M + C	0.83%[a] (5/602)	N/A
34	Tanzania (Dar es Salaam)	2010	Primary school	420	51.0%	6–19 (mean 11.4 ± 2.8)	Cl + M + C	2.60% (11/420)	*T. rubrum* (45.5%, 5) *T. mentagrophytes* (36.4%, 4) *T. floccosum* (9.1%, 1) *T. schoenleinii* (9.1%, 1)
4	Spain (Barcelona)	2009	Schools	1305	50.1%	3–15	Cl + M + C	2.50% (23/1305)	*T. mentagrophytes* (45.70%, 10) *T. rubrum* (31.40%, 10) *T. tonsurans* (11.40%, 1) *T. floccosum* (5.70%, 1) *M. gypseum* (2.90%, 1) *Tricophyton* sp. (2.90%, 1)
35	Peru (Lima and Calla)	2008	Schools	1387	NA	12–17	Cl + M + C	6.70%[a] (93/1387)	N/A
21	Turkey (Istanbul)	2006	Elementary schools	7158	57.7%	6–14	Cl + M + C	3.30% (11/7158)	*T. rubrum* (100%, 3)
29	Spain (Barcelona)	2005	Schools	1305	49.0%	3–15	Cl + M + C	2.90% (39/1305)	*T. rubrum* (41%, 18) *T. mentagrophytes* (41%, 17) *E. floccosum* (8.3%, 3) *T. tonsurans* (2.5%, 1)
13	Turkey[c] (Gaziantep)	2005	Male boarding school	321*	100%	14–19	Cl + M + C	15.60%[a] (50/321)	N/A
36	Turkey (Eskisehir)	2004	Schools	2384	60.4%	11–19	Cl + M + C	2.10% (51/2384)	*T. rubrum* (62%, 31) *T. mentagrophytes* (26%, 13) *T. verrucosum* (10%, 6) *T. violaceum* (2%, 1)

(Continues)

TABLE 1 | (Continued)

References	Country (locality)	Publication year	Study cohort	Total number of children (*n*)	Male % of total children	Age range in years	Diagnostic method	Prevalance (number of cases/total)	Etiological agents (%, *n*)
15	Israel (Jerusalem)	2002	Schools	1148	52.0%	5–14	Cl + M + C	6.90% (77/1148)	*T. rubrum* (68%, 52)[a] *T. mentagrophytes* (18.7%, 14)[a] *C. albicans* (12%, 9)[a] *M. canis* (1.3%, 1)[a]
19	Taiwan (Taitung City)	2000	Primary schools	3029	53.6%	N/A	Cl	4.10% (123/3029)	N/A
17	Australia (State of Victoria)	1999	School	2491	47.0%	4–18	Cl + M + C	5.20% (135/2491)	*T. mentagrophytes* (61.2%, 82) *T. rubrum* (34.3%, 46) *E. floccosum* (1.5%, 2) *T. terrestre* (1.5%, 2) *T. tonsurans* (0.74%, 1) *M. gypseum* (0.74%, 1)
14	Saudi Arabia (Abha)	1996	Intermediate and Secondary school	647	100%	11–19 (mean 15.3 ± 1.9)	Cl	1.90% (12/647)	N/A
28	Nigeria (Ekpoma)	1996	Primary school	1400	N/A	N/A	Cl + M + C	1.50%[a] (21/1400)	*T. rubrum* (28.6%, 6) *T. mentagrophytes* (33.3%, 7) *E. floccosum* (38.1%, 8)
31	Sri Lanka (Colombo)	1993	Pediatric Dermatology Clinic	1194	N/A	N/A	Cl + M + C	0.25% (3/1194)	N/A
37	Denmark (Copenhagen)	1983	Schools	347	52.7%	15	Cl + M + C	3.70% (13/347)	*T. rubrum* (38%, 5[a]) *T. mentagrophytes* (15%, 2[a]) *E. flocccosum* (23%, 3[a])
27	Nigeria (N/A)	1978	Primary school	390	N/A	6–12 (mean 8.5)	Cl + M + C	2.50% (10/390)	*T. rubrum* (90%, 55) *T. mentagrophytes* (10%, 6)
38	Tanzania (Shinyanga)	1974	Primary schools	782	50.0%	6–19 (mean 13.0)	Cl + M + C	3.80%[a] (30/782)	N/A

(Continues)

TABLE 1 | (Continued)

References	Country (locality)	Publication year	Study cohort	Total number of children (*n*)	Male % of total children	Age range in years	Diagnostic method	Prevalance (number of cases/total)	Etiological agents (%, *n*)
20	Philippines (Manila)	1973	Elementary School	4185	50.7%	7–16	Cl + M + C	0.33% (14/4185)	*C. albicans* (90%, 9) *T. rubrum* (10%, 1)
32	Scotland[c] (Glasgow)	1973	Swimming baths	508**	N/A	0–16	Cl + M + C	3.90% (20/508)	*T. mentagrophytes* (62.1%, 41) *T. rubrum* (13.6%, 9) *E. floccosum* (10.6%, 7) *E. floccosum* + *T. mentagrophytes (3%, 2)*
16	England (Bristol)	1959	Schools	4794	N/A	7–14	Cl + M + C	3.60% (176/4794)	*T. mentagrphytes* (84.4%, 152) *T. rubrum* (7.2%, 13) *E. floccosum* (3.9%, 7)

Abbreviations: C, culture; *C., Candida*; Cl, clinical; *E., Epidermophyton*; *H. Hendersonula*; M, microscopy; *M., Microsporum*; N/A, not available; *T., Trichophyton*.
[a]Calculation based on data extracted from the article.
[b]Diagnosis was primarily made clinically with laboratory testing for a few patients.
[c]Studies on the prevalence of tinea pedis in children were extracted from studies with a mixed children and adult population.
*Number of children/total (adults and children): 321/682.
**Number of children/total (adults and children): 508/773.

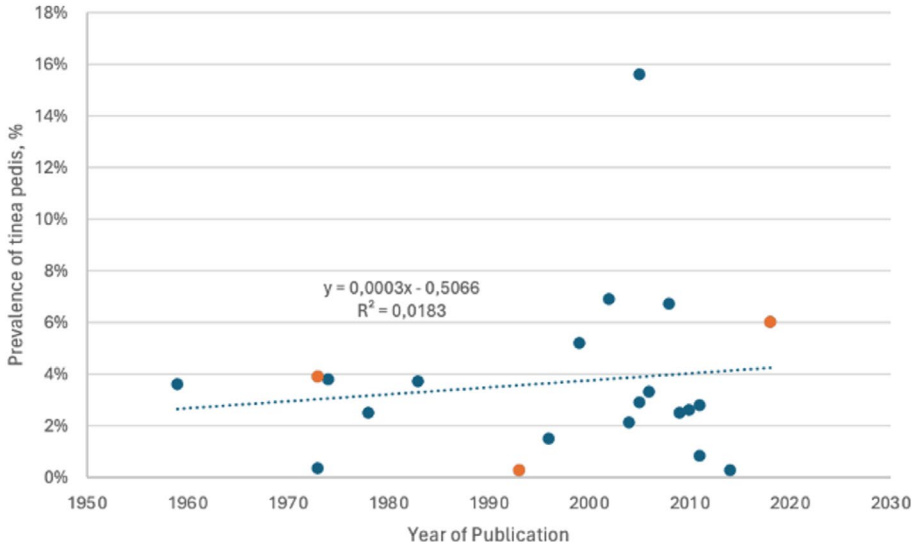

FIGURE 2 | Timeline of prevalence in studies using a combination of clinical examination, microscopy, and culture for diagnosis of pediatric tinea pedis. Blue: Studies conducted at schools [4, 16–18, 20, 21, 26–29, 33–38]. Orange: Studies from dermatology clinics (2018, 1993) [23, 31] and public swimming pools (1973) [35]. Notice the outlier at 15.6% from a male boarding school in Turkey [13]. *p*-Value: 0.952. 95% CI: (−0.0140361;0.0147446).

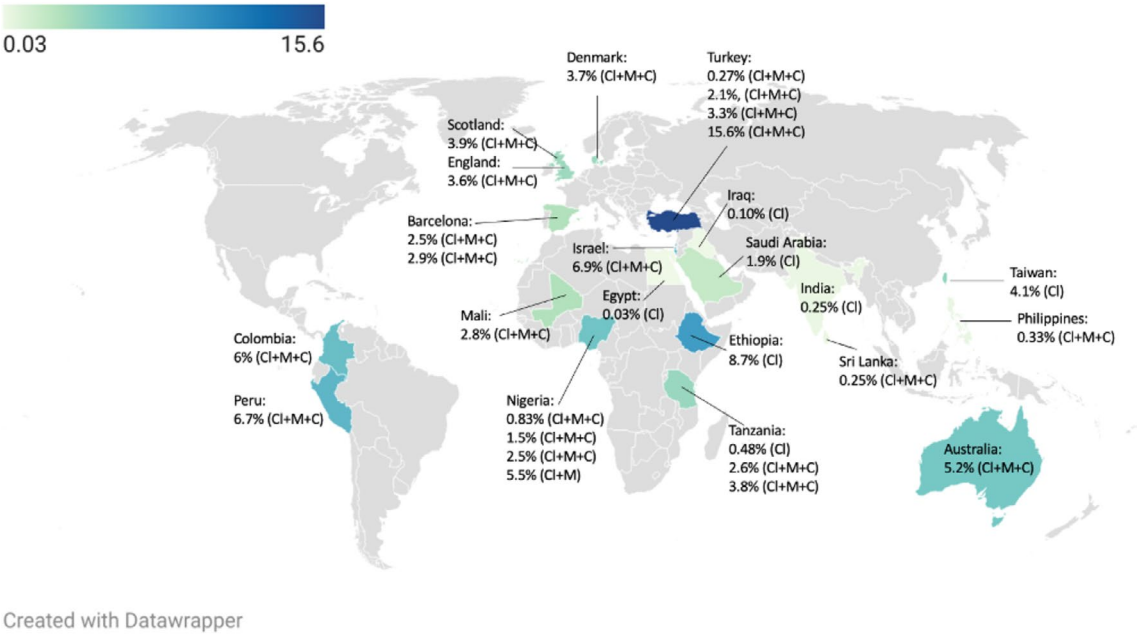

FIGURE 3 | Global prevalence of pediatric tinea pedis (%). C: culture; Cl: Clinical; M: Microscopy.

This was followed by *Trichophyton mentagrophytes* (303/719; 42%) and *Epidermophyton floccosum* (37/719; 5%). In one study from England, *T. mentagrophytes* was found eight times more often than *T. rubrum* and *E. floccosum* [16]. Yeast infections accounted for 4% (31/750), where *Candida albicans* (19/31; 61%) was the most frequently isolated agent, followed by *Rhodotorula* sp. (8/31; 26%) [18]. Fourteen studies did not mention the etiological agent [11–14, 19, 22–26, 31, 33, 35, 38]. Two studies reported multiple isolates among children with tinea pedis [30, 32]. One study from Colombia reported co-infections of *T. mentagrophytes* + *E. floccosum* (1 case), *T. rubrum* + *Microsporum canis* (2 cases), and *T. rubrum* + *T. mentagrophytes* (1 case) [30]. A study from Scotland reported a co-infection of *E. floccosum with T. mentagrophytes* (2 cases) [32]. Further details are available in Table 1.

4 | Discussion

This systematic review combines global research on the prevalence of tinea pedis in children, which is less studied than in adults. Overall, findings reveal heterogeneous studies with variations among countries when reporting the prevalence of tinea pedis. Possible reasons include diagnostics, climate, and/or immigration [29, 39]. The findings are not statistically significant (*p*-value 0.952), 95% confidence interval (−0.0140361;

0.0147446). Some of the data after the year 2000 remain consistent with earlier studies, showing an average prevalence of ~4%. Studies from Tanzania [12, 34, 38] and Nigeria [11, 27, 28, 33] show a decline, with Tanzania dropping from 2.50% to 0.83% and Nigeria from 3.80% to 2.60% (Table 1). This trend might be linked to improved hygiene and healthcare.

Geographically, the highest prevalence is observed in equatorial regions (Figure 3), suggesting a link between tinea pedis, warm climates, and humidity [40]. Increased cases during summer months [41, 42], suggest risks related to wearing sandals or going barefoot in warmer climates [1]. The lowest prevalence was in regions with cold winters and dry summers [18] (Table 1), confirming the potential link to climate. Regional differences include Turkey, where four studies using identical diagnostics (Table 1) reported prevalence rates ranging 0.27%–15.60% [13, 18, 21, 36]. The highest prevalence was at a male boarding school [13], in line with studies showing higher infection rates in males [1, 15, 17, 19, 41, 43], and in environments with shared bathing facilities like boarding schools [44].

Among the studies, 72.0% (21/29) confirmed diagnosis using a combination of clinical examinations, microscopy, and culture. Prevalence ranged from 0.25% to 15.6% [4, 16–18, 20, 21, 26–38] (Table 1), potentially influenced by laboratory expertise and equipment. Disparities in clinical examiners, including teachers, nurses, physicians, pediatricians, and dermatologists, may have caused over- or under-diagnosis, especially for children with darker skin tones, where clinical diagnostics may be more challenging [45]. A higher prevalence was reported in rural and low socio-economic settings, compared to urban settings and high socio-economic areas [15, 18, 19, 24–28], indicating a notable impact of study settings.

Dermatophytes (719/750; 96%), particularly *T. rubrum* (383/719; 53%), were the most common etiological agent, consistent with previous studies [1, 3, 46]. Yeasts accounted for 4% (31/750) (Table 1). Prevalence increased with age [14, 15, 21, 41], e.g. 25.5% in Turkish adolescents (17–19 years) vs. 7.2% in children aged 14–16 years [13]. In Israel, prevalence was 2.1-fold higher in children aged 12–14 compared to children aged 5–8 years [15]. This may be due to longer lifespans, increased risk of exposure, participation in sports, military service [47, 48] or higher risk of certain diseases (e.g., diabetes) [49].

Swift diagnose and treatment of tinea pedis is crucial to prevent its progression to onychomycosis [50, 51], which may require systemic treatment [52]. We therefore expected studies to report on co-infections with onychomycosis, which we found in six studies (6/29, 20.7%) [4, 15, 18, 21, 22, 29]. Higher prevalence was expected in dermatology clinics and in children using public swimming facilities, compared to population-based studies, as the exposure is higher.

This review's limitations include the exclusion of non-English articles and lack of studies with standardized diagnostic methods, making comparisons difficult. Furthermore, 48.0% (14/29) of studies did not specify the etiological agent (Table 1). None of the studies included children across the full age range of 0–19 years, resulting in narrower age brackets (Table 1). The data did not allow adjustment for potential confounders or mediators affecting outcomes, such as living conditions or healthcare access. Strengths include large study populations, diverse geographic representation, a majority of studies conducted in school settings, and the inclusion of only peer-reviewed articles. Given that the latest included study was published in 2020, further research is necessary to confirm the findings.

5 | Conclusion

This review identified dermatophytes, primarily *T. rubrum*, as the predominant etiological agent. However, the included studies exhibited heterogeneity, such as the absence of standardized diagnostic methods and insufficient documentation of other comorbidities, including onychomycosis. More comprehensive and standardized research is necessary to determine the exact prevalence of tinea pedis in the pediatric population. Nevertheless, healthcare professionals should remain vigilant in recognizing pediatric tinea pedis to improve prevention and treatment strategies.

Acknowledgments

The authors would like to thank Statistical Advisory Services at the Department of Public Health, University of Copenhagen, for the assistance.

Conflicts of Interest

D.M.L.S. reports personal fees from Galderma, AbbVie, Janssen, Jamjoon Pharma, and Sanofi, grants, and personal fees from Abbvie, Leo Pharma, Pfizer, UCB, and Novartis outside the submitted work. J.E.B.S. and N.F.G. declares no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are openly available in PubMed Central (PMC) at https://pubmed.ncbi.nlm.nih.gov/.

References

1. A. K. Leung, B. Barankin, J. M. Lam, K. F. Leong, and K. L. Hon, "Tinea Pedis: An Updated Review," *Drugs Context* 12 (2023): 1–16.

2. Antifungal Agents for Common Paediatric Infections," *Paediatrics & Child Health* 12, no. 10 (2007): 875–883.

3. C. Kruithoff, A. Gamal, T. S. McCormick, and M. A. Ghannoum, "Dermatophyte Infections Worldwide: Increase in Incidence and Associated Antifungal Resistance," *Life* 14, no. 1 (2023): 1, https://doi.org/10.3390/life14010001.

4. M. Perez-Gonzalez, J. P. Torres-Rodriguez, A. Martinez-Roig, et al., "Prevalence of Tinea Pedis, Tinea Unguium of Toenails and Tinea Capitis in School Children From Barcelona," *Revista Iberoamericana de Micología* 26, no. 4 (2009): 228–232.

5. H. Ward, N. Parkes, C. Smith, S. Kluzek, and R. Pearson, "Consensus for the Treatment of Tinea Pedis: A Systematic Review of Randomised Controlled Trials," *Journal of Fungi* 8, no. 4 (2022): 351.

6. S. Vestergaard-Jensen, A. Mansouri, L. H. Jensen, G. B. E. Jemec, and D. M. L. Saunte, "Systematic Review of the Prevalence of Onychomycosis in Children," *Pediatric Dermatology* 39, no. 6 (2022): 855–865.

7. T. C. Jones, "Overview of the Use of Terbinafine (Lamisil) in Children," *British Journal of Dermatology* 132, no. 5 (1995): 683–689.

8. R. Yontef, "Oral and Topical Treatment of Tinea Pedis," *Clinical Medicine* 70 (1963): 2015–2025.

9. M. J. Page, J. E. McKenzie, P. M. Bossuyt, et al., "The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews," *BMJ* 372 (2021): n71, https://doi.org/10.1136/bmj.n71.

10. M. Ouzzani, H. Hammady, Z. Fedorowicz, and A. Elmagarmid, "Rayyan-A Web and Mobile App for Systematic Reviews," *Systematic Reviews* 5, no. 1 (2016): 210.

11. E. I. Kalu, V. Wagbatsoma, E. Ogbaini-Emovon, V. U. Nwadike, and C. K. Ojide, "Age and Sex Prevalence of Infectious Dermatoses Among Primary School Children in a Rural South-Eastern Nigerian Community," *Pan African Medical Journal* 20 (2015): 1–12.

12. M. Amiri, F. F. Furia, and M. Bakari, "Skin Disorders Among Children Living in Orphanage Centres in Dar Es Salaam, Tanzania," *Tropical Medicine and Health* 48, no. 1 (2020): 1–7.

13. A. A. Tuncel and Z. Erbagci, "Prevalence of Skin Diseases Among Male Adolescent and Post-Adolescent Boarding School Students in Turkey," *Journal of Dermatology* 32, no. 7 (2005): 557–564.

14. K. Bahamdan, A. A. R. Mahfouz, T. Tallab, I. A. Badawi, and O. M. Al-Amari, "Skin Diseases Among Adolescent Boys in Abha, Saudi Arabia," *International Journal of Dermatology* 35, no. 6 (1996): 405–407.

15. V. Leibovici, R. Evron, M. Dunchin, N. Strauss-Leviatan, M. Westerman, and A. Ingber, "Population-Based Epidemiologic Study of Tinea Pedis in Israeli Children," *Pediatric Infectious Disease Journal* 21, no. 9 (2002): 851–854.

16. M. P. English and M. D. Gibson, "Studies in the Epidemiology of Tinea Pedis. I. Tinea Pedis in School Children," *British Medical Journal* 1, no. 5135 (1959): 1442–1446.

17. K. Merlin, M. Kilkenny, A. Plunkett, and R. Marks, "The Prevalence of Common Skin Conditions in Australian School Students: 4 Tinea Pedis," *British Journal of Dermatology* 140, no. 5 (1999): 897–901.

18. E. Balci, M. Gulgun, O. Babacan, et al., "Prevalence and Risk Factors of Tinea Capitis and Tinea Pedis in School Children in Turkey," *Journal of the Pakistan Medical Association* 64, no. 5 (2014): 514–518.

19. Y. H. Wu, H. Y. Su, and Y. J. Hsieh, "Survey of Infectious Skin Diseases and Skin Infestations Among Primary School Students of Taitung County, Eastern Taiwan," *Journal of the Formosan Medical Association* 99, no. 2 (2000): 128–134.

20. A. C. Reyes and I. Factora-Anunciacion, "A Survey of Superficial Fungus Infections Among Elementary School Children in Manila," *Southeast Asian Journal of Tropical Medicine and Public Health* 4, no. 4 (1973): 543–553.

21. B. Hapcioglu, Y. Yegenoglu, R. Disci, Z. Erturan, and H. Kaymakcalan, "Epidemiology of Superficial Mycosis (Tinea Pedis, Onychomycosis) in Elementary School Children in Istanbul, Turkey," *Collegium Antropologicum* 30, no. 1 (2006): 119–124.

22. M. Leiva-Salinas, I. Marin-Cabanas, I. Betlloch, et al., "Tinea Capitis in Schoolchildren in a Rural Area in Southern Ethiopia," *International Journal of Dermatology* 54, no. 7 (2015): 800–805.

23. A. K. Burman, R. Bansal, S. Sharma, A. Krishna, and S. Ahmad, "An Epidemiological Study of Prevalence of Skin Diseases Among Secondary School Going Children in District Meerut," *Indian Journal of Public Health Research and Development* 11, no. 6 (2020): 36–42.

24. T. A. Alkubaisi, J. I. S. Al-Mashhadani, N. N. A. Alhayani, and J. S. O. Al-Kubaisy, "Socio-Epidemiological Study of Infectious Skin Diseases Among School Children in Heet District, Iraq," *Medico-Legal Update* 20, no. 4 (2020): 1057–1062.

25. E. A. El-Khateeb, R. A. Lotfi, K. M. Abdel-Aziz, and S. E. El-Shiekh, "Prevalences of Skin Diseases Among Primary Schoolchildren in Damietta, Egypt," *International Journal of Dermatology* 53, no. 5 (2014): 609–616.

26. O. Coulibaly, M. A. Thera, A. A. Djimde, et al., "Dermatomycoses in Rural and Peri-Urban Schoolchildren in Mali," *Mycoses* 54 (2011): 68.

27. F. Soyinka, "Epidemiologic Study of Dermatophyte Infections in Nigeria (Clinical Survey and Laboratory Investigations)," *Mycopathologia* 63, no. 2 (1978): 99–103.

28. I. B. Enweani, C. C. Ozan, D. E. Agbonlahor, and R. N. Ndip, "Dermatophytosis in Schoolchildren in Ekpoma, Nigeria," *Mycoses* 39, no. 7–8 (1996): 303–305.

29. L. Triviño-Duran, J. M. Torres-Rodriguez, A. Martinez-Roig, et al., "Prevalence of Tinea Capitis and Tinea Pedis in Barcelona Schoolchildren," *Pediatric Infectious Disease Journal* 24, no. 2 (2005): 137–141.

30. Z. Alvarado and C. Pereira, "Fungal Diseases in Children and Adolescents in a Referral Centre in Bogota, Colombia," *Mycoses* 61, no. 8 (2018): 543–548.

31. J. Perera and C. Perera, "Fungal Skin Infections in a Paediatric Dermatology Clinic," *Ceylon Medical Journal* 38, no. 2 (1993): 75–77.

32. J. C. Gentles and E. G. Evans, "Foot Infections in Swimming Baths," *British Medical Journal* 3, no. 5874 (1973): 260–262.

33. S. A. Adefemi, L. O. Odeigah, and K. M. Alabi, "Prevalence of Dermatophytosis Among Primary School Children in Oke-Oyi Community of Kwara State," *Nigerian Journal of Clinical Practice* 14, no. 1 (2011): 23–28.

34. E. V. Komba and Y. M. Mgonda, "The Spectrum of Dermatological Disorders Among Primary School Children in Dar Es Salaam," *BMC Public Health* 10 (2010): 765.

35. J. M. Flores, V. B. Castillo, F. C. Franco, and A. B. Huata, "Superficial Fungal Infections: Clinical and Epidemiological Study in Adolescents From Marginal Districts of Lima and Callao, Peru," *Journal of Infection in Developing Countries* 3, no. 4 (2009): 313–317.

36. S. Metintas, N. Kiraz, D. Arslantas, et al., "Frequency and Risk Factors of Dermatophytosis in Students Living in Rural Areas in Eskisehir, Turkey," *Mycopathologia* 157, no. 4 (2004): 379–382.

37. E. Svejgaard, B. Albrectsen, and N. Baastrup, "The Occurrence of Tinea of the Feet in 15-Year-Old School Children," *Mykosen* 26, no. 9 (1983): 450–454.

38. H. Nsanzumuhire and A. E. J. Masawe, "Dermatological Disorders in Children in Mainland Tanzania," *East African Medical Journal* 51, no. 12 (1974): 844–849.

39. P. Nenoff, D. Reinel, C. Krüger, et al., "Tropical and Travel-Related Dermatomycoses: Part 1: Dermatophytoses," *Der Hautarzt* 66, no. 6 (2015): 448–458.

40. O. Coulibaly, C. L'Ollivier, R. Piarroux, and S. Ranque, "Epidemiology of Human Dermatophytoses in Africa," *Medical Mycology* 56, no. 2 (2018): 145–161.

41. H. Shimoyama and Y. Sei, "2016 Epidemiological Survey of Dermatomycoses in Japan," *Medical Mycology Journal* 60, no. 3 (2019): 75–82.

42. C. Kromer, D. Celis, U. C. Hipler, V. A. Zampeli, R. Mossner, and U. Lippert, "Dermatophyte Infections in Children Compared to Adults in Germany: A Retrospective Multicenter Study in Germany," *Journal of the German Society of Dermatology* 19, no. 7 (2021): 993–1001.

43. H. C. Zienicke, H. C. Korting, A. Lukacs, and O. Braun-Falco, "Dermatophytosis in Children and Adolescents: Epidemiological, Clinical, and Microbiological Aspects Changing With Age," *Journal of Dermatology* 18, no. 8 (1991): 438–446.

44. F. Crawford and S. Hollis, "Topical Treatments for Fungal Infections of the Skin and Nails of the Foot," *Cochrane Database of Systematic Reviews*, no. 3 (2007): 1–124.

45. K. A. Williams, B. Wondimu, A. M. Ajayi, and O. Sokumbi, "Skin of Color in Dermatopathology: Does Color Matter?," *Human Pathology* 140 (2023): 240–266.

46. S. Das, R. Goyal, and S. N. Bhattacharya, "Laboratory-Based Epidemiological Study of Superficial Fungal Infections," *Journal of Dermatology* 34, no. 4 (2007): 248–253.

47. E. Svejgaard, J. Christophersen, and H. M. Jelsdorf, "Tinea Pedis and Erythrasma in Danish Recruits. Clinical Signs, Prevalence, Incidence, and Correlation to Atopy," *Journal of the American Academy of Dermatology* 14, no. 6 (1986): 993–999.

48. K. M. Brocks, U. B. Johansen, H. O. Jorgensen, L. R. Ravnborg, and E. L. Svejgaard, "Tinea Pedis and Onychomycosis in Danish Soldiers Before and After Service in Ex-Yugoslavia," *Mycoses* 42, no. 7–8 (1999): 475–478.

49. T. Ogawa, A. Matsuda, Y. Ogawa, and R. Tanaka, "Risk Factors for the Development of Tinea Pedis and Onychomycosis: Real-World Evidence From a Single-Podiatry Center, Large-Scale Database in Japan," *Journal of Dermatology* 51, no. 1 (2024): 30–39.

50. J. C. Szepietowski, A. Reich, E. Garlowska, M. Kulig, and E. Baran, "Factors Influencing Coexistence of Toenail Onychomycosis With Tinea Pedis and Other Dermatomycoses: A Survey of 2761 Patients," *Archives of Dermatology* 142, no. 10 (2006): 1279–1284.

51. G. Piérard, "Onychomycosis and Other Superficial Fungal Infections of the Foot in the Elderly: A Pan-European Survey," *Dermatology* 202, no. 3 (2001): 220–224.

52. A. K. Gupta, R. G. Sibbald, C. W. Lynde, et al., "Onychomycosis in Children: Prevalence and Treatment Strategies," *Journal of the American Academy of Dermatology* 36, no. 3 Pt 1 (1997): 395–402, https://doi.org/10.1016/s0190-9622(97)80215-0.

Appendix A

Database	Search	Search string	Number of results
PubMed Date 07 Oct 2024	#1	Search: ((("Tinea pedis"[MeSH Terms]) OR ("Tinea pedis"[Text Word] OR "Athlete* foot"[Text Word] OR ringworm*[Text Word])) AND (("Child"[Mesh]) OR (Child*[Text Word] OR baby[Text Word] OR babies[Text Word] OR youth[Text Word] OR adolescent*[Text Word] OR pediatric*[Text Word] OR infant*[Text Word] OR preschool*[Text Word] OR youngster*[Text Word] OR newborn*[Text Word] OR kid[Text Word] OR kids[Text Word] OR toodler*[Text Word] OR teen[Text Word] OR teenage*[Text Word] OR teen-age*[Text Word]))) AND ((((((("Cross-Sectional Studies"[Mesh]) OR "Cohort Studies"[Mesh]) OR "Observational Studies as Topic"[Mesh]) OR "Epidemiologic Studies"[Mesh]) OR "Epidemiology"[Mesh]) OR (Cohort[Text Word] OR cohort study[Text Word] OR cohort studies[Text Word] OR Cross-Sectional study[Text Word] OR Cross-Sectional studies[Text Word] OR Cross Sectional Analysis[Text Word] OR epidemiology[Text Word] OR epidemiologic study[Text Word] OR epidemiologic studies[Text Word] OR observational study[Text Word] OR observational studies[Text Word]))	418
	#2	Search: ((("Tinea pedis"[MeSH Terms]) OR ("Tinea pedis"[Text Word] OR "Athlete* foot"[Text Word] OR ringworm*[Text Word])) AND (("Child"[Mesh]) OR (Child*[Text Word] OR baby[Text Word] OR babies[Text Word] OR youth[Text Word] OR adolescent*[Text Word] OR pediatric*[Text Word] OR infant*[Text Word] OR preschool*[Text Word] OR youngster*[Text Word] OR newborn*[Text Word] OR kid[Text Word] OR kids[Text Word] OR toodler*[Text Word] OR teen[Text Word] OR teenage*[Text Word] OR teen-age*[Text Word]))) AND ((((((("Cross-Sectional Studies"[Mesh]) OR "Cohort Studies"[Mesh]) OR "Observational Studies as Topic"[Mesh]) OR "Epidemiologic Studies"[Mesh]) OR "Epidemiology"[Mesh]) OR (Cohort[Text Word] OR cohort study[Text Word] OR cohort studies[Text Word] OR Cross-Sectional study[Text Word] OR Cross-Sectional studies[Text Word] OR Cross Sectional Analysis[Text Word] OR epidemiology[Text Word] OR epidemiologic study[Text Word] OR epidemiologic studies[Text Word] OR observational study[Text Word] OR observational studies[Text Word])) Filters: Child: birth-18 years	380
	#3	Search: ((("Tinea pedis"[MeSH Terms]) OR ("Tinea pedis"[Text Word] OR "Athlete* foot"[Text Word] OR ringworm*[Text Word])) AND (("Child"[Mesh]) OR (Child*[Text Word] OR baby[Text Word] OR babies[Text Word] OR youth[Text Word] OR adolescent*[Text Word] OR pediatric*[Text Word] OR infant*[Text Word] OR preschool*[Text Word] OR youngster*[Text Word] OR newborn*[Text Word] OR kid[Text Word] OR kids[Text Word] OR toodler*[Text Word] OR teen[Text Word] OR teenage*[Text Word] OR teen-age*[Text Word]))) AND ((((((("Cross-Sectional Studies"[Mesh]) OR "Cohort Studies"[Mesh]) OR "Observational Studies as Topic"[Mesh]) OR "Epidemiologic Studies"[Mesh]) OR "Epidemiology"[Mesh]) OR (Cohort[Text Word] OR cohort study[Text Word] OR cohort studies[Text Word] OR Cross-Sectional study[Text Word] OR Cross-Sectional studies[Text Word] OR Cross Sectional Analysis[Text Word] OR epidemiology[Text Word] OR epidemiologic study[Text Word] OR epidemiologic studies[Text Word] OR observational study[Text Word] OR observational studies[Text Word])) Filters: Child: birth-18 years, English	309
Embase Date 10 Oct 2024	#1	exp tinea pedis/	3219
	#2	(tinea pedis or athlete* foot or ringworm).mp. [mp = title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	4599
	#3	1 or 2	4599
	#4	exp child/	3,261,080
	#5	exp pediatric patient/	64,237
	#6	exp infant/	1,189,790
	#7	exp adolescent/	1,880,012
	#8	exp juvenile/	4,262,255
	#9	(Child* or baby or babies or youth or adolescent* or pediatric* or infant* or preschool* or youngster* or newborn* or kid or kids or toodler* or teen or teenage* or teen-age*).mp. [mp = title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	5,179,016
	#10	(pediatric adj2 patient).mp. [mp = title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	79,034
	#11	4 or 5 or 6 or 7 or 8 or 9 or 10	5,265,888

Database	Search	Search string	Number of results
	#12	exp epidemiology/	4,893,785
	#13	exp observational study/	396,188
	#14	exp cross-sectional study/	670,577
	#15	exp cohort analysis/	1,229,037
	#16	(Cohort or cohort study or cohort studies or Cross-Sectional study or Cross-Sectional studies or cross-sectional analysis or epidemiology or epidemiologic study or epidemiologic studies or observational study or observational studies).mp. [mp = title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	4,198,586
	#17	12 or 13 or 14 or 15 or 16	6,866,405
	#18	3 and 11 and 17	457
	#19	limit 18 to English	375
	#20	limit 19 to (infant <to 1 year> or child <unspecified age> or preschool child <1–6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>)	305