

Prevalence of dermatosis in scholars in the region of ABC paulista

Prevalência de dermatoses em escolares na região do ABC paulista

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Abstract: BACKGROUND: Literature shows that prevalence of skin diseases in children and adolescents aged 7-14 years is very significant, as well as lack of treatment worsening the situation.

OBJECTIVES: An investigative analysis was conducted to determine the prevalence of skin diseases in individuals 7-14 years and focus on whether or not they are related directly to their respective socio-economic status.

METHODS: 200 children and adolescents were examined aged 7-14 years, between August and November 2006, 100 children in two public schools located in the periphery and 100 in two private schools located in upper middle-class neighborhood in Santo André, located in São Paulo. Investigative method used was the clinical examination of the whole skin, mucous areas and palpable ganglia, and the population sample analyzed according to the chi-square.

RESULTS: 87.5% of children had some skin disease. 46 dermatoses were found, the most important: a) melanocytic nevi ($p < 0.001$); b) acne grade II ($p = 0.004$); c) pityriasis alba ($p < 0.001$); d) livedo reticularis ($p = 0.025$); e) pediculosis ($p < 0.001$); f) asteatosis ($p < 0.001$); g) frictional dermatitis ($p = 0.007$). Small prevalence of skin diseases was observed in children in public schools (53.14%).

CONCLUSIONS: This population sample indicated that 87.5% of children had skin diseases, which prevalence was much higher than those found in the literature (30-50%), showing a lightly enhanced prevalence in public schools. The study showed the neglect of parents and caregivers, indicating the need for interference from public policy, which lack certainly is responsible for high rate and can increase it.

Keywords: Child; Livedo reticularis; Skin diseases; Students

Resumo: FUNDAMENTOS: A literatura mostra que a prevalência de doenças dermatológicas em crianças e adolescentes com idades de 7-14 anos é consideravelmente significante, bem como a falta de tratamento e possível agravamento da situação.

OBJETIVOS: Realização de uma análise investigativa para apontar a prevalência de dermatoses em indivíduos de 7-14 anos, assim como para verificar se estas estão diretamente ligadas ou não a suas respectivas situações socioeconômicas.

MÉTODOS: Analisaram-se 200 crianças e adolescentes com idades de 7-14 anos, entre os meses de agosto e novembro de 2006, sendo 100 crianças em duas escolas públicas localizadas na periferia e 100 em duas escolas particulares localizadas em bairro de classe média alta na cidade de Santo André, Grande São Paulo. Para tanto, utilizou-se o método investigativo, com exame clínico de toda a superfície corpórea, de mucosas e de gânglios palpáveis, sendo a amostra populacional analisada de acordo com o teste qui-quadrado.

RESULTADOS: 87,5% das crianças apresentaram algum tipo de dermatose; encontraram-se 46 dermatoses, destacando-se: a) nevos melânicos ($p < 0,001$); b) acne grau II ($p = 0,004$); c) pitíriase alba ($p < 0,001$); d) livedo reticular ($p = 0,025$); e) pediculose ($p < 0,001$); f) asteatose ($p < 0,001$); g) dermatite friccional ($p = 0,007$). Constatou-se uma pequena predominância das dermatoses nas crianças das escolas públicas (53,14%).

CONCLUSÕES: A amostra dessa população indicou que 87,5% das crianças apresentaram dermatoses, uma prevalência muito maior do que a encontrada na literatura (30% a 50%) e uma prevalência discretamente mais elevada nas escolas públicas. O estudo mostrou a indiferença dos pais e responsáveis, o que aponta para a necessidade de interferência de políticas públicas, cuja falta, certamente, é responsável por esse índice elevado e possível agravamento da prevalência.

Palavras-chave: Criança; Dermatopatias; Estudantes; Livedo reticular

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INTRODUCTION

Children and adolescents with several different skin diseases are often seen in dermatology offices, as shown in the literature. The high incidence of these diseases among children 6 to 15 years of age certainly raises the need to conduct a specific study with schoolchildren of various regions to gauge and reiterate the need to establish educational and recognition programs targeted at this age group, as well as periodic check-ups to prevent these dermatoses.

Within this context and seeking more efficient action on the part of health and education professionals, we selected a portion of the student population aged from 7 to 14 years in the region of Santo Andre, ABC paulista, to participate in this study. So far, no studies have been conducted in this region, as no records were found in the literature.

Of the results found in the literature researched, some were taken from general studies which conducted censuses in municipalities and large populations. In this study, we conducted a detailed survey of the skin conditions found; therefore, we present a smaller sample as compared to other research in the literature.

Thus, the objectives of this study are to research the prevalence of skin diseases found in private schools and public schools, comparing the results of the two different types of institutions, and to compare the data found in this study with those from existing literature.

MATERIALS AND METHODS

This study consists of an investigative research whose data were collected between August and November 2006. It is important to note that although it was springtime, it was relatively cold and rainy during the days of the dermatologic examinations.

The type of research conducted was a population profile of a statistically scaled sample of 200 children and adolescents between 7-14 years of age. This choice was due to the sample size of this study, which was calculated to compare the proportion of skin diseases in private and public schools. In this case, it was assumed that the expected percentage of skin diseases in private schools is 50% and in public schools, 70%. With a statistical power of 82% and significance level of 5%, the estimated sample size was 200 children, with 100 children coming from private schools and 100 from public schools. Children were more inclined to accept to participate in the study than adolescents.

The schools listed in the research were those that agreed to participate; many schools were invited (both public and private, nineteen in all), but most

did not accept to participate or did not allow research.

We investigated two private and two public schools; 100 schoolchildren attended private schools located in upper-middle class areas, and another 100 attended public schools in the periphery. Therefore, we conclude that the socioeconomic status of these two samples was a factor that distinguished them. All the schools were located in the municipality of Santo Andre, in the metropolitan region of Sao Paulo, Sao Paulo State.

The inclusion criteria were: a) age between 7 and 14 years, b) consent of the surveyed population and c) consent forms signed by parents or guardians. Exclusion criteria consisted of adolescents who were pregnant at the beginning of the study.

It is relevant to mention that the four schools evaluated authorized the research, which was conducted through personal visits made to the schools by the researchers. Each school provided an isolated room, which was specially prepared with adequate lighting and privacy to allow full dermatologic examinations.

Students were brought into the entrance to the examination room by the teacher in charge and in this room a collaborator filled out a form with the student's personal identification information. Next, the dermatologic examination was conducted by the researcher. Clinical examination of the entire body surface, mucous membranes and palpable ganglia was performed. Data obtained were written in the document that already contained in its header the patient's personal information. Upon diagnosis of a skin disease, initial treatment was provided to the student, together with a follow-up treatment. This treatment was explained to the teacher so that she could instruct the parents or guardians of the students when they came to pick them up.

The following data were collected: a) gender - male or female, b) color - white, albino, yellow (East Asians), mestizo (pardo) or black, c) skin phototype - I to VI, d) type of institution - private or public, and e) diagnosis, which were described by frequency, absolute and relative, in each school, and compared using the chi-square test.

The age of the children was described by statistics such as mean, standard deviation, minimum and maximum value and median, and compared using the t test for independent variables.

With regard to diagnosis, the following sub-items were analyzed:

- 1) children who at the time of the dermatologic examination did not show any skin lesion (eudermia)
- 2) children who had only one skin disease at the time of examination, which were then classified

into sub-groups:

- 2.1) inflammatory skin diseases
- 2.2) infectious skin diseases
- 2.3) benign neoplastic skin diseases
- 3) more than one dermatosis (mixed).

This denomination of 'mixed' group was chosen by the authors to include children with two, three or more skin diseases belonging to different sub-groups (item 2).

The prevalence of skin diseases in private and public schools was compared using the chi-square or Fisher's exact test when appropriate. Statistical significance was considered for p values <0.05 . Statistical calculations and graphs were produced using the Minitab statistical software, version 5.

RESULTS

To evaluate the results we used the following parameters: a) type of institution (private or public), b) school level; c) age d) gender e) skin color, f) skin phototype, and g) diagnosis.

For each of these parameters sub-items such as the following were considered:

1) Children and adolescents who at the time of the dermatologic examination did not show any skin lesion (eudermia).

2) Children who had only one skin disease at the time of dermatologic examination, which were then classified into sub-groups:

- 2.1) inflammatory skin diseases;
- 2.2) Infectious skin diseases;
- 2.3) benign neoplastic skin diseases;
- 3) more than one dermatosis.

Of the total children examined, the analysis of school level showed a prevalence of 8 and 11-year-old students, at 17% each, followed by 9-year-olds (16%), 12 and 13-year-olds (10% each), 7-year-olds (9%) and 14-year-olds (7%). The level of education in public and private schools was not statistically significant (chi-square $p = 0.183$).

Female students (53%) predominated in relation to male students (47%); however, the distribution of boys and girls in the public and private schools was uneven, with preponderance of female children in private schools and male students in public schools. This difference in distribution was statistically significant with $p = 0.033$ by the chi-square test.

White skin color predominated in both institutions. The distribution of ethnicity in public and private schools showed statistically significant results, as shown by Fisher's exact test ($p < 0.001$).

Table 1 below shows all the diagnoses of skin diseases observed, totaling 354 findings, with 152 in private school children and 196 in public school

children.

At the time of the examination, 25 children showed no skin disease (eudermia).

Of the 200 children evaluated, 175 (87.5%) had skin diseases; 82% of these children were from private schools and 93%, from public schools. The comparison between the results found in public and private schools was statistically significant, indicating that the prevalence of skin diseases was higher in public schools ($p = 0.048$).

Fisher's exact test indicates there was a statistically significant difference in the following cases: melanocytic nevi ($p < 0.001$), grade II acne ($p = 0.004$), pityriasis alba ($p < 0.001$), livedo reticularis ($p = 0.025$), pediculosis ($p < 0.001$); asteatosis ($p < 0.001$) and frictional dermatitis ($p = 0.007$).

In cases of melanocytic nevi and grade II acne, the proportion of children with these diagnoses was higher in the private schools. In the case of other diagnosis, such as pityriasis alba, livedo reticularis, pediculosis, asteatosis, and frictional dermatitis, the proportion of children with these diagnoses was higher in the public schools.

Cases of nail dystrophy (onychophagia), grade I acne, seborrheic dermatitis, ephelides, stretch marks, keratosis pilaris and eczematid showed no statistically significant difference between the schools.

All the other diagnoses listed were observed at a very small frequency and, therefore, statistical comparison between the schools was not made; frequencies were presented for each case only.

All the diagnoses were divided into four groups: infectious skin diseases, inflammatory skin diseases, benign neoplasms and mixed group (combination of two or more different types of diagnoses belonging to two or three distinct classes of skin diseases). Graph 1 below considers only the 175 children (82 in private school and 93 in public school) who had skin diseases.

Data concerning the two children who had infectious skin diseases were excluded from the analysis so that the chi-square test could be performed in the school domain.¹

The chi-square test indicated a significant difference between the schools regarding the type of skin diseases found ($p = 0.021$). The largest differences relate to cases of inflammatory skin diseases (more frequent in public school children) and skin tumors (more common in private school children).

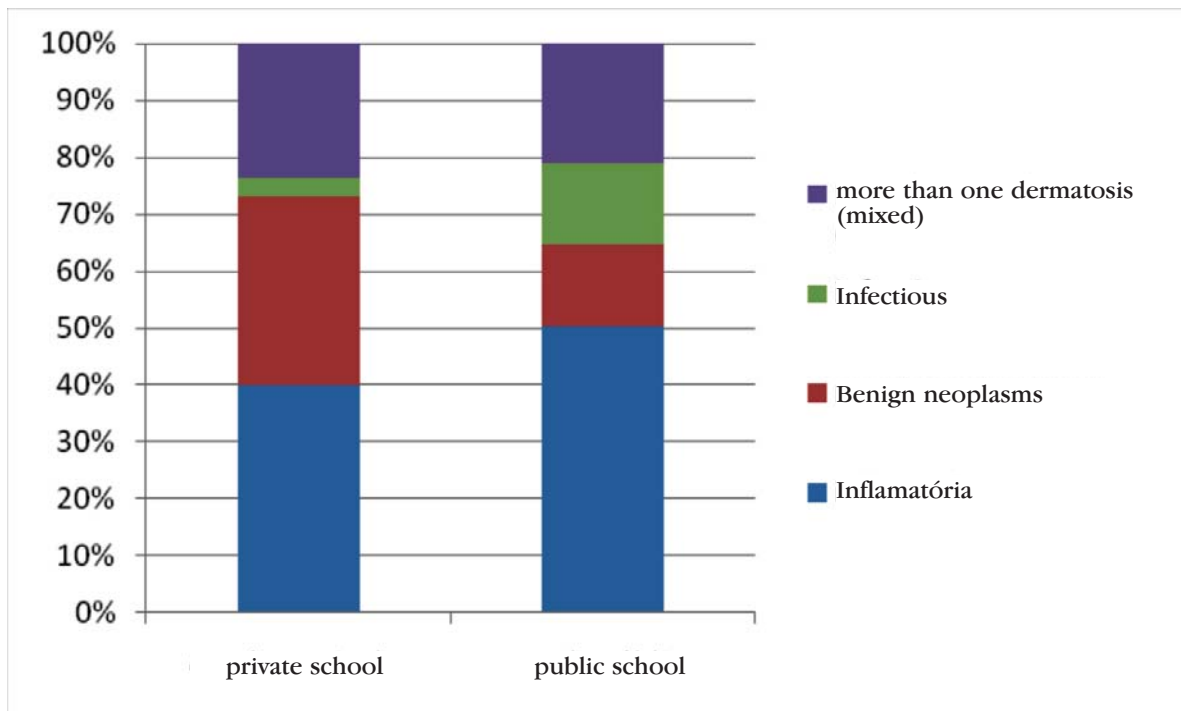
DISCUSSION

The sample was divided into two social classes: the children who attended the private schools included in the study belonged to middle and upper-

TABELA 1: Diagnósticos das dermatoses encontradas nas escolas particulares e públicas

Dermatoses	Escola particular		Escola pública		P
	N	%	N	%	
Nevos melânicos	47	47,0	21	21,0	<0,001a
Pitíriase alba	8	8,0	29	29,0	<0,001a
Onicofagia	18	18,0	15	15,0	0,704a
Acne grau II	19	19,0	5	5,0	0,004a
Livedo reticular	6	6,0	17	17,0	0,025a
Acne grau I	9	9,0	11	11,0	0,814a
Dermatite seborreica	6	6,0	11	11,0	0,311a
Pediculose	0	0,0	17	17,0	<0,001a
Asteatose	0	0,0	13	13,0	<0,00a
Líquen friccional	0	0,0	8	8,0	0,007b
Eférides	2	2,0	5	5,0	0,445b
Estrias	5	5,0	2	2,0	0,445b
Ceratose pilar	4	4,0	2	2,0	0,683b
Eczemátide	1	1,0	5	5,0	0,212b
Dermatite atópica	2	2,0	3	3,0	>0,999b
Nevos celulares	4	4,0	0	0,0	0,121b
Dermatite de contato	1	1,0	2	2,0	>0,999b
Neurodermite	0	0,0	3	3,0	0,246b
Onicomiose	2	2,0	1	1,0	>0,999b
Pseudoacantose nigricans	2	2,0	1	1,0	>0,999b
Malformação vascular capilar	1	1,0	1	1,0	c
Ictiose vulgar	0	0,0	2	2,0	0,497b
Nevos hipocrômicos	0	0,0	2	2,0	0,497b
Paroníquia	2	2,0	0	0,0	0,497b
Pitíriase versicolor	1	1,0	1	1,0	c
Pitting ungueal	2	2,0	0	0,0	0,497b
Queilite actínica	0	0,0	2	2,0	0,497b
Queilite angular	0	0,0	2	2,0	0,497b
Tinha dos pés	1	1,0	1	1,0	c
Verruga filiforme	1	1,0	1	1,0	c
Cicatriz queiloideana	1	1,0	0	0,0	>0,999b
Cicatrizes de estrófulo	0	0,0	1	1,0	>0,999b
Eczema numular	0	0,0	1	1,0	>0,999b
Enantema	1	1,0	0	0,0	>0,999b
Escabiose	0	0,0	1	1,0	>0,999b
Estrófulo	0	0,0	1	1,0	>0,999b
Grânulos de Fordyce	1	1,0	0	0,0	>0,999b
Hemangioma	0	0,0	1	1,0	>0,999b
Hiperkeratose plantar	0	0,0	1	1,0	>0,999b
Ictiose lamelar	0	0,0	1	1,0	>0,999b
Língua "em morango"	1	1,0	0	0,0	>0,999b
Língua plicata	0	0,0	1	1,0	>0,999b
Líquen estriado	0	0,0	1	1,0	>0,999b
Máculas hipocrômicas cicatriciais	0	0,0	1	1,0	>0,999b
Molusco contagioso	0	0,0	1	1,0	>0,999b
Hemangioma rubi	0	0,0	1	1,0	>0,999b
Nevos sebáceos de Jadassohn	1	1,0	0	0,0	>0,999b
Nódulos subcutâneos por aplicação Insulina	1	1,0	0	0,0	>0,999b
Onicodistrofia traumática	0	0,0	1	1,0	>0,999b
Retração	1	1,0	0	0,0	>0,999b
Telangiectasias	1	1,0	0	0,0	>0,999b
Total	100	100	100	100	

a Teste qui-quadrado de Pearson; b teste exato de Fisher; c nenhum teste estatístico necessita ser aplicado



GRAPH 1: Distribution of the different groups of skin diseases between private and public schools

middle classes in a neighborhood considered of high standard in the city of Sao Paulo, and the children who attended the public schools included in the research came from low and middle-low classes. Both public schools were located within the same community.

Bechelli et al.¹ conducted a study in which the schools were subdivided into three groups (A, predominance of higher social status, B intermediate situation, and C, predominance of poorer or very poor students), but they were randomly chosen in a draw. Romiti et al.² surveyed skin diseases only in the municipal schools of the city of Santos, Sao Paulo State. In the study by Perrera et al., the authors also included private schools in their research, and the schools were also chosen in a draw, while the research focus of the study by Souza et al.⁴ was only a public school. Bechelli et al.¹ also found a higher predominance of female students, similarly to Souza et al.⁴ Romiti et al.¹ do not mention differentiation of their sample by gender.

Inanir et al.⁵ conducted a study in 2002 with a similar sample to the one in this study, which analyzed 785 schoolchildren aged 6 to 14 years in a region of Turkey. Despite the fact that the primary focus of the study was fungal skin diseases, the authors also established a socioeconomic comparison between the participants. They emphasized that children of lower socioeconomic status are more susceptible to skin

diseases, thus agreeing with the result shown here.

Caucasians (86%) predominated in both institutions, as compared to other ethnic groups: mestizos (pardos) 6.5%, black and yellow (East Asians), 3.5% each, and albino, 0.5%, similar to what was observed by Romiti et al.¹ In the study by Perrera et al.³, as well as in the study by Souza et al.,⁴ this variable was not mentioned.

In this study, the 200 children examined were classified into five groups: eudermia, inflammatory skin diseases, infectious skin diseases, benign neoplasms and mixed group (more than one class of dermatosis). The classification suggested in this study was not observed in the literature researched. Forty-six skin diseases were observed. Twenty-five children (12.5%) had no skin lesion (eudermia). Romiti et al.¹ include the number of "healthy" children (63%) in a table, which would correspond to the group classified as eudermia. Perre et al.³ indirectly mention a number corresponding to 29% of the sample of "students without skin diseases". The percentage of 63% found in the study by Romiti et al. contrasted to the findings of this research work (12.5%). Perre et al.³ found a closer percentage in their study (29%). This work is also different because it compares the percentage of children without skin diseases (eudermia) in public (3.5%) and private schools (9%).

Of the 175 children with dermatologic alterations, there was a higher prevalence of these

diseases in public schools (93%) as compared with private schools (82%). Skin diseases were observed in public schools, as also observed by Perris et al.³

Regarding the type of dermatosis, inflammatory skin diseases predominated in public school children, followed by the mixed group and benign tumors, while in private schools there was also a predominance of inflammatory skin diseases followed by the group of benign tumors. This is different from what was observed in the study by Perris et al.,³ where there was a predominance of infectious skin diseases in both public and private schools. Bechelli et al.² did not perform this analysis; instead, they evaluated each disease separately. Other works that investigate skin diseases in general, but not in school environments, indicate a predominance of infectious skin diseases, as in the study by Pizzol,⁶ Gül et al. in Turkey.⁷ In the study by Santos et al.⁸, there was a predominance of inflammatory skin diseases (allergic skin diseases). The same was observed in the study by Oliveira Filho et al.⁹

Of the skin diseases found, only pityriasis alba, melanocytic nevi, acne and asteatosis had statistical significance. Other skin diseases that showed statistical significance were livedo reticularis, pediculosis and frictional dermatitis. Bechelli et al.² also showed that pigmented nevus was the most common dermatosis, and acne was the seventh most prevalent disease. In the work by Romitti et al.,^A infectious diseases prevailed: zoonosis followed by superficial mycosis. In the study by Perris et al.,³ pediculosis predominated. This was equally observed in the study by Souza,⁴ in which pediculosis and scabies were the most prevalent diseases. Magnabosco et al.,¹⁰ in a study conducted in the periphery of Porto Alegre, found an incidence of scabies of 11.07%. In another study conducted in Poland by Lonc and Okulewicz¹¹, there was a greater association between infestation by scabies and a lower socioeconomic status. This was not observed in our research in public schools, which are theoretically more numerous in the periphery of cities.

Popescu et al.¹² conducted an investigative study of Romanian children to obtain specific information on socioeconomic aspects, as well as on the lack of information by parents or guardians about the development and aggravation of skin diseases. Their sample was constituted by 1,114 schoolchildren aged 6-12 years, an age range that is similar to the one in this study, and the authors found skin diseases in 22.8%, with no significant differences in relation to gender, except for pityriasis alba, which predominated in males ($P = 0.007$). Similarly to the results of this study, a high incidence of pediculosis, acne and infectious skin diseases, among others, was

found.

In this study, upon analyzing the diseases separately for each type of institution, the proportion of children with acne and melanocytic nevi was higher in the private schools, while skin diseases such as pityriasis alba, livedo reticularis, pediculosis, asteatosis, and frictional dermatitis predominated among public school students.

WK Fung et al.¹³ conducted a research of 1,006 children 6-14 years old, in Hong Kong, which pointed to the prevalence of children with skin diseases during October and November 1996. The students answered a simple questionnaire and based on their answers it was observed that 314, or 31.3%, had one or more skin diseases; the most common were acne (9.9%), eczema (6.8%), dermatitis (4.4%) nevi (3.6%), superficial fungal infections (2.2%), pediculosis (1.3%) and pityriasis alba (1.0%), which represented 93% of the skin diseases found, all aggravated due to lack of medical guidance. Perris et al.,³ in their work, did not evaluate the incidence of nevi and livedo reticularis; contrarily, they observed a greater number of children with acne in public schools rather than in private schools. In the same study, there were large numbers of children with pityriasis versicolor, in contrast to the present research where only two cases of the disease were found. With regard to pityriasis versicolor, the same is observed in a study by Nascimento and Bastos,¹⁴ in a public school.

In our study we found only two cases of tinea; one was diagnosed in a private institution and the other in a public school. In a study conducted in a day care center,⁶ Pizzol found only three cases of tinea. Souza et al.⁴ did not find any children with tinea in a study conducted in a public school in Fortaleza.

An interesting finding in this study was the large number of children diagnosed with onychophagy - 18% in private schools and 15% in public schools - data already researched by the authors of this study.

As for livedo reticularis, which prevailed in public schools (17%), it is important to stress that the bibliographical research was conducted during the coldest months of the year, which could contribute to more diagnoses of the disease in children during the examination. It is also worth noting the low occurrence of infectious skin diseases, which is not generally observed in the literature researched, as in Romitti et al.¹ and Perris et al.³

This work is also different for presenting a classification of the group of children who had more than one skin disease diagnosed at the dermatologic examination (mixed group); so far, this classification hasn't been found.

Nascimento and Bastos¹⁴ investigated the

incidence of pityriasis versicolor in the municipality of Bragança in the state of Para, in a population of 100 students aged from 5 to 14 years, where 38 (57.6%) had this dermatosis, followed by 47% of the students who were diagnosed with tinea corporis. Popoola et al¹⁵ investigated the above mentioned dermatoses in Nigeria in an age range between 8 and 14 years, but the comparison was made in relation to urban and rural areas, with a higher peak of incidence at age 11 and greater frequency in the head and neck.

The results of studies conducted in underdeveloped or developing countries strongly suggest that these children are more susceptible to skin diseases. In the investigative study conducted by Yh Wu et al,¹⁶ the authors surveyed skin infections and infestations among elementary school children in Taitung County in Taiwan. The sample included 3,029 students evaluated from March to October 1998. It was found that the most common skin diseases were pediculosis (12.9%), vulgar warts (5.1%), pityriasis (8.5%), plantar warts (1.8%) and scabies (1.4%). The study concluded that the poorer the region, the greater the incidence of skin diseases, and lack of information is still the greatest difficulty encountered¹⁷⁻¹⁸. This is in agreement with studies by Dogra et al¹⁹ who conducted their studies with 12,586 children aged 6 to 14 years in northern India, proving that a considerable portion of the individuals (38.8%) had visible skin diseases. The most prevalent were skin infections (11.4%), pityriasis alba (8.4%), dermatitis / eczema, nonspecific (5.2%), infestation (5.0%), pigmentation disorders (2.6%), keratinization disorders (1.3%) and nevi (1.1%). This study shows that skin diseases are common in children and that about a third of them are affected at any given time.

Therefore, this research was different from those found in the literature and is relevant because it

was conducted in a region where skin diseases had not been investigated. It also showed interesting and relevant aspects, such as lack of information in two distinct environments (public and private schools) regarding the need for periodic dermatologic examinations.²⁰⁻²² Another interesting aspect was the observation that most parents or guardians of the children examined in the two types of institution did not consider the research important or necessary, thus making it very difficult for the investigation to be easily conducted. This impression is based on the fact that none of the students who were advised to seek a professional for follow-up after the first examination did so. We believe it is important that periodical examinations and educational campaigns be methodically and more frequently conducted, so that skin health can be better appreciated and skin diseases, prevented.

CONCLUSION

The children studied showed a much higher (87.5%) predominance of skin diseases than that found in the literature (30-50%). Although slight, we found a prevalence of females. There was also a predominance of white individuals. The population of lower socioeconomic status (public school students) had the highest rate of skin diseases such as pityriasis alba, livedo reticularis, pediculosis, asteatosis, and frictional dermatitis. Inflammatory skin diseases predominated in this group of children, whereas benign neoplasms predominated in private school children. Due to the results found, we conclude that, ultimately, this study highlights the importance of creating public programs to promote awareness about the importance of dermatological health throughout the community. □

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