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Original Article

PREVALÊNCIA DE PEDICULOSE DE CABEÇA EM CRIANÇAS INSERIDAS EM CENTROS MUNICIPAIS DE EDUCAÇÃO INFANTIL

PREVALENCE OF HEAD LICE ON CHILDREN IN MUNICIPAL CHILDHOOD EDUCATIONCENTERS

LA PREVALENCIA DE PIOJOS EN LOS NIÑOS EN LOS CENTROS MUNICIPALES DE EDUCACIÓN INFANTIL

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RESUMO

Objetivo: O estudo objetivou identificar a prevalência da pediculose de cabeça entre crianças de 2 a 5 anos inseridas nos Centros Municipais de Educação Infantil (CMEI) de Divinópolis, MG. **Método:** O método de estudo utilizado foi o transversal, de base populacional, com amostra de 326 crianças. Realizou-se inspeção da cabeça e aplicação de questionário sociodemográfico. O modelo multivariado de análise estatística utilizado foi a Regressão Linear de Poisson. **Resultados:** A prevalência de pediculose de cabeça foi de 15,3%. Constatou-se que as meninas têm maior chance de apresentarem a pediculose (RP=3,21; p<0,0001). **Conclusão:** Conclui- se que a pediculose de cabeça continua sendo um agravo importante na população infantil, apontando a necessidade de aproximação entre comunidade, escola e serviço de saúde para ações de promoção à saúde e prevenção desta parasitose.

Descritores: Infestações por piolhos; Criança; Pré-escolar.

ABSTRACT

Objective: The study aimed to identify the prevalence of head pediculosis among children aged 2 to 5 years inserted in Municipal Childhood Education Centres (CMEI) in Divinópolis, MG, Brazil. **Method:** The study method used was cross-sectional, population-based, with a sample of 326 children. The children's head was inspected and a sociodemographic questionnaire was applied. The multivariate statistical analysis used was Poisson's Linear Regression. **Results:** The prevalence of head lice infestation was 15.3%. Girls are more likely to have pediculosis (PR = 3.21; p < 0.0001). **Conclusion:** It is concluded that the head lice infestation remains a considerable problem in children, pointing out the need for closer ties between community and school health services to promote health and prevent this disease.

Descriptors: Lice infestations; Child; Child preschool.

RESUMEN

Objetivo: El objetivo del estudio fue identificar la prevalencia de la pediculosis de la cabeza en niños de 2 a 5 años insertados en los centros municipales de educación infantil (CMEI) en Divinópolis, MG, Brasil. **Método:** El método utilizado fue transversal y poblacional, con una muestra de 326 niños. Fueron inspeccionadas las cabezas y fue aplicado un cuestionario sociodemográfico. El análisis estadístico multivariado utilizado fue la Regresión Lineal de Poisson. **Resultados:** La prevalencia de la infestación por piojos de la cabeza fue del 15,3 %. Se encontró que las niñas son más propensas a tener la pediculosis (RP = 3,21; p < 0,0001). **Conclusión:** Se concluye que la infestación por piojos de la cabeza sigue siendo un problema considerable en los niños, señalando la necesidad de estrechar los vínculos entre los servicios comunitarios y de salud escolar para promover acciones para la salud y la prevención de esta enfermedad.

Descriptores: Infestaciones por piojos; Niño; Preescolar.

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INTRODUCTION

Head pediculosis is an important public health problem, mainly in underdeveloped countries. In Brazil, for example, in view of the existing socioeconomic differences, this problem continues to exist, mainly in places where people have very close contact, like in Childhood Education Centers (CEI)[1]. Pediculosis is the cutaneous infestation caused by the presence of *Pediculus humanuscapitis,* popularly known as head lice. The lice eggs, whose presence in the hair is easily observed, are known as nits. They belong to the *Pediculidae* family and inhabit people's head. The entire lifecycle (egg, nymph and adult) develops on the host's head, being considered an obligatory hematophagous ectoparasite, that is, they necessarily feed on blood[2].

Despite the scarce publications on the prevalence of pediculosis in the population, its great spread across the populations is evidenced, with frequencies varying from country to country, between less than 2% and more than 50%, being more frequent in women and children[3,4]. A study in the United States showed that lice infestations are common in patients between three and 11 years of age and that about six million individuals per year are affected by this problem, being mostly women[5].In the same sense, results from another study described the high prevalence of pediculosis in children from orphanages and who were attended at public health services in the city of Manaus - AM, reaching 27.1% in children between zero and five years and 46.7% in children of up to 10 years old[6].

In a Latin American study, it was shown that Argentina, Brazil and Chile are the countries with more available data on pediculosis. These identified average prevalence rates in their populations, including all age ranges, of 46.6%, 30.9% and 23.8%, respectively[4].The cause of this variation can be explained by different factors, including the frequency of head-to-head contact, the number of people in the same environment, as well as improper diagnostic techniques, ineffective eradication methods, resistance to pesticides, mistaken knowledge on the cause and treatment of pediculosis, and the perception that pediculosis is not a health problem[3].

Although civilization and progress have been favorable to the fight against pediculosis, in function of the improved health conditions, the adoption of daily hygiene practices and the increased production of personal hygiene material, it is known today that, in many places and in some social groups, personal hygiene is not effective yet to combat this parasitosis[1]. The existence of ineffective intersectoral practices between health and education also contribute to the maintenance of this problem. In a study in Londrina-PR, it was shown that the health team tends to act punctual and restrictedly at the CEI, mainly in vaccination campaigns[1].

Therefore, the existence of practices between health and education to establish health promotion and disease prevention among students still does not respond to the childhood population and families' true needs. In that sense, it is evidenced that, due to the lack of integral, intersectoral and effective actions, the approach of pediculosis is done precariously by the families and teachers, without proper professional preparation, a fact that can put the children's healthy growth and development at risk[1].

Another factor that probably explains the high prevalence rates of pediculosis is the inappropriate treatment. It is known that the methods used to control parasitoids are classified as physical and chemical. The most used chemical treatment in public health is the topical application of the insecticide 1% Permethrin on the scalp, but is only effective against the adult parasite[5]. Oral Ivermectin is another effective chemical method to fight pediculosis with high toxicity, impeding its large-scale use.

In addition, the resistance the parasites develop to the drugs contributes for the infestation to continue, representing one of the main problems in the control and eradication of pediculosis[8].This capacity to resist the drugs' action results from the lice's continuing exposure to sub lethal doses, that is, below the level needed to kill 100% of the parasites[9]. In fact, many children are exposed to improper treatment, without professional orientation, entailing greater damage than the expected benefit, resulting in the insufficient application of the ant parasitic drug and provoking the parasite's resistance.

Despite the existence of efficient drugs in the market, the physical methods, that is, the picking and combing with a fine-toothed comb to eliminate the lice, are fundamental in the treatment process, as the ant parasitic drugs do not fight the nits, but only the adult parasite[3,8]. No therapy exists today that guarantees 100% of

mortality of the eggs, which explains the importance of effective manual treatment to remove the nits. Combing with a fine-toothed comb can remove nymphs and adults and its daily use can prevent new female lice from putting their eggs[10].These methods are highly effective to prevent early infestation if practiced consistently, besides being safe and economical. Nevertheless, they are not efficient because not all people are motivated, skilled and have free time for these activities and to do them effective and permanently, contributing to the maintenance of pediculosis[9].

It is important to mention that pediculosis is a problem that causes different implications for people's health. In children, it can affect the learning process due to difficulties to concentrate and stay well[4]. That is due to the intense itching of the scalp, mainly in the neck and behind the ears, and can also cause constraints due to the scratching. The teachers, in turn, in cases of widespread infestation, can remove the infected children or even suspend the classes, aiming to avoid the dissemination of the disease[10]. Another important implication of this problem is that children with severe infestation can also develop anemia due to the hematophagy of the parasite[11].In view of these implications, health education actions are essential to reduce the frequency of pediculosis, which can be achieved through the implementation of operative groups with children and teachers in the schools[10].

Therefore, as head pediculosis is a problem that entails implications for people's quality of life, mainly for the child age range and considering that, in the city of Divinópolis - MG, no data are available on the prevalence of this parasitosis, we believe that the identification of populations with the disease can contribute to survey the need for treatment, prevention and control actions. Therefore, the question raised is: What is the frequency of head pediculosis among children in the city of Divinópolis? The objectives in this study are to identify the prevalence of head pediculosis among children at the Municipal Childhood Education Centers in Divinópolis, MG and to assess factors associated with the prevalence of pediculosis in this population.

METHODS

An epidemiological, cross-sectional, population-based study was undertaken. The study was carried out at the Municipal Childhood Education Centers (CMEI) in Divinópolis - MG.

The study population consisted of 326 children aged two to five years, a representative sample of the universe of 3126 children enrolled in the CMEIs during the study period. The sample size calculation considered a 5% margin of error.

Data collection was performed through a clinical examination to identify the head pediculosis. Therefore, each child was examined, through an inspection of the head, during three minutes, in order to identify the presence of the infestation. The child was taken to a specific place for the examination, where other persons than the examiner and the child to be examined had no access. A questionnaire was also applied to the parent or guardian, containing questions related to the child's past history of pediculosis, the current history of anemia, information on school performance and sociodemographic characteristics.

The survey data were typed through double data entry and processed in Microsoft Office Excel 2013. Statistical analysis was performed in SPSS version 20.0. The level of significance was 0.05. The data were described by absolute and relative frequencies. The tests used were asymptotic Pearson chi-square (when 20% of the expected value ranged between one and five and 80% of the expected value was superior to 5) and exact chi-square (when more than 20% of the expected value ranged between 1 and 5). The statistical model used was Poisson's Linear Regression with robust variance. All variables with $p < 0.20$ entered the multivariate analysis.

The study was approved by the Research Ethics Committee of Universidade Federal de São João del-Rei (CAAE 38850514.9.0000.5545), respecting all ethical precepts in accordance with Resolution No.466/2012 on research involving human beings.

RESULTS AND DISCUSSION

The predominant age range of the children who participated in the study was four years old (39.3%), with good school performance (54.6%), family income between one and three minimum wages (81.6%), whose parents or responsible caregivers had finished secondary education (37.7%) and were employed (72.1%), in accordance with Table 1. The prevalence of pediculosis found in the research was 15.3%, and 23.3% of the children had already presented this

parasitosis earlier, being treated through the picking method (76.7%). One and a half percent of the parents declared that the child was anemic at the moment of the research (Table 1).

Table 1 – Characteristics of the study population. Divinópolis, Minas Gerais, Brazil, 2015. n=326

Variables	n	(%)
Age		
2	34	10.4
3	89	27.3
4	128	39.3
5	75	23.0
School performance		
Excellent	7	2.2
Good	178	54.6
Bad	140	42.9
Income		
1-3 minimum wages	266	81.6
4-6 minimum wages	57	17.5
More than 7 minimum wages	3	0.9
Parents' education		
Finished Primary Education	59	18.1
Unfinished Primary Education	16	4.9
Finished Secondary Education	123	37.7
Unfinished Secondary Education	41	12.6
Higher Education	20	6.1
Unfinished Higher Education	9	2.8
Occupation		
Employed	235	72.1
Unemployed	74	22.7
Pediculosis	50	15.3
Background history of pediculosis	76	23.3
Type of treatment		
Picking	250	76.7
Medication	53	16.3
Combing	33	10.1
Anemia	5	1.5

Source: elaborated by the authors.

What the factors associated with head pediculosis are concerned, in the univariate analysis, it was verified that the prevalence is higher in children with a background history of pediculosis (58%, p<0.0001), of whom (32%, p<0.001) used picking as the treatment method, and among girls (76%, p <0.0001). In this study, the prevalence of pediculosis was not associated with the presence of anemia (Table 2).

Table2- Prevalence of head pediculosis in the study population. Divinópolis, Minas Gerais, Brazil. 2015.

Variables	Current Presence of Pediculosis				Total	P-value
	Yes n=50	%	No n=276	%	n=326	
Background history of pediculosis						
Yes	29	38.2	47	61.8	76	<0.001[2]
No	21	8.4	229	91.6	250	
Type of pediculosis treatment						
No information	20	8.2	225	91.8	245	<0.001[1]
Picking	16	33.3	32	66.7	48	

Medication	10	35.7	18	64.3	28	
Combing	4	80.0	1	20.0	5	
Gender						
Male	12	7.3	152	92.7	164	<0.001[2]
Female	38	23.5	124	76.5	162	
Age						
2	4	11.8	30	88.2	34	0.413[2]
3	13	14.6	76	85.4	89	
4	17	13.3	111	86.7	128	
5	16	21.3	59	78.7	75	
Anemia						
Yes	1	20.0	4	80.0	5	1.000[1]
No	49	15.3	272	84.7	321	

1 Pearson's exact chi-squared test. 2 Pearson's asymptotic chi-squared test.
Source: elaborated by the authors.

The multivariate analysis of the factors associated with the prevalence of head pediculosis showed that only gender continued in the final model. Thus, it was observed that girls had 3.21 times more chance of presenting pediculosis when compared to boys (Table 3).

Table 3 - Multivariate model (final) of the factors associated with head pediculosis. Divinópolis, Minas Gerais, Brazil, 2015.

	Current Presence of Pediculosis				PR	95%CI PR	P-value
	Yes	%	No	%			
	n= 50		n= 276				
Gender							
Female	38	(23.5%)	124	(76.5%)	3.21	1.74	
Male	12	(7.3%)	152	(92.7%)	1	5.91	<0.0001

Source: elaborated by the authors.

In this study, we identified a prevalence of 15.3% of head pediculosis. This is the first cross-sectional study on the prevalence of head pediculosis among children in Divinópolis. When comparing the results of this research with a study of children in Jundiaí - SP, it was verified that 39.4% of the participants were infected[12]. In the North of the country, in Manaus, 18.5% of the children in seven educational institutions in the urban region had head pediculosis[13]. In a study in the city of Yucatan, Mexico, 13.6% of a total of 140 children presented thecomplaint[14]. High prevalence rates among schoolchildren have been described in investigations in Uruguay (67%) and Venezuela (81.5%)[4]. Countries such as Norway[3] and Korea[15] show prevalence rates of 1.3% and 4.1%, respectively, lower than the present study.

The prevalence of pediculosis was higher among children who had already suffered from parasitosis at some time in their lives and who underwent treatment exclusively by the picking method. Although these variables were not maintained in the final model, this finding highlights the reinfestation problem. In a study carried out in 2011 with school children found that recurrence of this parasite occurs frequently, and a risk of reinfection was found for 35.54% of the children in this study, with more than one third of children with previous infestations having been contaminated again more than once. The author's justification for reinfestation is centered on the difficulty to eradicate lice and the lack of treatment when no treatment and medication are associated[3]. In fact, undue eradication of parasites by non-association of methods often results in treatment discharge failure and possibility of relapse[5].

The findings of the research conducted in 2012 showed that female children were more likely to present head pediculosis when compared to males, an association confirmed in the multivariate model. This result corroborates a Brazilian study with 147 children from a municipal school, in which the frequency of parasitized girls (67.1%) was three times higher than that of boys (21.1%)[12].

Significant association between female sex and the presence of pediculosis appears in results of other studies[4,3,13]. In popular culture, the

maintenance of long hair is considered a beauty pattern among girls, favoring the parasite's permanence and the maintenance and transmission of the disease[4,13]. Moreover, such association can be justified by the difference in social interactions between girls and boys. Girls have longer and closer contact with each other, while boys tend to have shorter contact[16].

Although this research has not identified an association among pediculosis, school performance and anemia, it is important to reinforce that the presence of this parasite entails implications for the health and life of the child. Incessant pruritus caused by the parasite favors a decrease in concentration, which can lead to poor school performance[4,9,17]. It is known that the presence of massive infestation of parasites causes anemia in children, implying greater attention to these cases[18].

Another important implication of pediculosis was identified in a study in a school in the Northeast of the state of São Paulo, Brazil, in which 50% of the children reported being ashamed and 20.8% sad because they were parasitized, mentioning that they hid the infestation from their colleagues so that were not discriminated against by the group. Therefore, the presence of pediculosis has psychological and social implications in the childhood group[10].

Considering that pediculosis of the head is a prevalent problem in the school environment, it is important that health care goes beyond the walls of hospitals and health centers and involves the participation of other sectors of society. Therefore, the Family Health Strategy should continuously seek integration with social institutions and organizations through partnerships[19]. In this context, the school is an interesting environment for the prevention of parasitosis because it is an environment that shapes the opinions of children, adolescents and their families, being a social device to be used as a health education scenario and tool, seeking to form conscious citizens who are responsible for their choices and behaviors, thus turning into an important ally for the strengthening of primary health care[20].

In order to regulate health activities in the school environment, Decree 6.286 from December 5, 2007 established the School Health Program (PSE) and its purposes. The PSE is the result of a partnership between the Ministries of Health and Education and aims to promote the health and culture of peace, emphasizing the prevention of health problems; articulate actions in the health and education sectors, using the school space and its resources; and strengthen the coping with these clients' vulnerabilities and encourage community participation by contributing to the integral training of students in the primary care network[21].

In this sense, the PSE constitutes a possibility of meeting a need that has long been discussed: strengthening integration between the education and health sectors, promoting the intersectoriality defended by the Unified Health System and the co-responsibility of these sectors, accustomed to working alone[20]. Regrettably, the city where this research was carried out has not yet implemented the PSE. Based on its objectives, this program could contribute effectively to reduce the prevalence of head pediculosis. As a study involving school children showed that health education actions at the school were directly related to the decrease in the number of cases, 33% of the children showed improvement in the index of lice infestation after these educational actions[12]. There is a clear need for longitudinal studies to follow the school performance and cognition level of the parasitized children.

CONCLUSION

Although head pediculosis has existed for a long time, it is still present among the children, mainly among the girls as the current study shows, underlining the need for approximation and communication among the school, health service and family and for heightened attention to the school performance and child health monitoring.

Therefore, the existence of an interface among the community, school and health service should be active, in order to produce appropriate knowledge and share information about the prevention, treatment and complications of the disease. This would be possible through the School Health Problem, which would articulate the public health network and the school, but which does not exist yet in the city under study, strengthening the need for support from education and health managers.

The community needs empowerment in order to be prepared to take care of children with emphasis on such an old problem that is still that present in the school environment.

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