



## School activities in health education and their impact on parents.

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### Abstract

There is little empirical evidence establishing the value of schoolhouse education of children and the repercussions on their families; a quantitative analysis of instructional intervention in health and its reflection on the family permits quantification of its effectiveness outside of the school setting. To this end, we utilized instruction on head lice in schoolchildren was conducted. A randomized sample of those responsible for students enrolled from the third to fifth grade, from two public schools who had taken an instructional module on pediculosis, were invited to respond to a questionnaire that aimed to ascertain their opinions on the instruction and what its impact was on their family. The variables were assessed by univariate analysis. Of 155 total respondents, 89.9% were the parents of the students. The students that had infestation, in turn, had greater capacity to influence the family on measures against lice. The majority of those responsible supported the instruction and reported being satisfied with the school for having addressed the theme. When the subject pertains to the reality of the students, the school-family link is strengthened. Instruction on pediculosis in school helps bridge the gap between the theoretical and the practical, a harmonization required in health education.

**Keywords:** school-aged children; health education; effectiveness outside; impact on parents; pediculosis.



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## Introduction

Data corroborate that in any educational program it is fundamental to involve the students and teachers to achieve the expected objectives (WHO, 1997), even though the involvement of parents with the themes addressed in school still must be explored in greater depth. Currently, there is little empirical evidence establishing the value of such education of schoolchildren and the effect on their parents; a quantitative analysis of instructional intervention in health and its reflection on the family enable quantification of its effectiveness outside of the school setting. Some studies show that the participation of the parents was positive and important for the success of programs for students with asthma, eating disorders and behavior problems (Mondadori et al., 2006; Haerens et al., 2006; Sanders, 2000; Evans et al., 1987). On the other hand, the effectiveness of the programs is compromised by the difficulty in including them or by the low degree of parental involvement (Chomitz et al., 2010; Beatty, Cross & Shaw, 2008; Díaz et al., 2006) and the form of counting on their participation in the process remains a challenge for researchers (McVey, Tweed & Blackmore, 2007). Obtaining the involvement of family members in the process permits education to reach beyond the school environment and reach the community of parents and potentially their circle of friends, which enables a greater number of persons to enjoy the fruits of the instructional action executed in school.

## Pediculosis

Pediculosis of the scalp affects populations of different social classes throughout the world (Falagas et al., 2008); its incidence has increased making it one of the most common skin infections in children (Sladden & Johnston, 2005). The school setting is indicated as one of the main locations for its acquisition (Willems et al., 2005; Speare & Buettnner, 1999) while its presence causes apprehension in the community (Hine, 2012; Kirchofer, Price & Telljohann, 2001). It should be emphasized that this preoccupation with pediculosis is not universal, given the existence of communities in which it is not a cause of concern (Heukkelbach & Ugbomoiko, 2011). Data obtained in Brazil show that its occurrence commences in preschool with 25.3% of individuals infested (Marchiori, Sousa e Silva & Silva, 2006) then grows to 35% in day care centers and public schools (Borges & Mendes, 2002) and in the general population where the prevalence rate in the poor community was 43.3% (Heukkelbach, 2005). Some studies explain the head lice as a simple matter of hygiene (Mahmud, Pappas & Hadden, 2011), nevertheless the problem is multifaceted. Another highly relevant factor is the trivialization and non-recognition of pediculosis as a medical disease (Burkhart, 2005), on the other hand complication associated with pediculosis was observed in patients with myiasis in 16 of 71 of them (Marquez, Mattos & Nascimento, 2007). For a teacher, the existence of infested students in the classroom can provoke stress. The child, in turn, assumes much of the onus, including being held responsible for being a carrier of the parasite (De Berker & Sinclair, 2000), which provokes fear, anxiety and blame (Mumcuoglu, 1991). It is also imputed as the cause of irritation and loss of sleep while the infested person is stigmatized by colleagues (Silva, Alencar & Madeira, 2008); are potentially injurious to the child and also potentially damage to parents and child with persistent head lice (Gordon, 2007). Some of those parasitized are treated by the parents or guardians with highly toxic substances (Doulgeraki & Valari 2011; Gordon, 2007), medicated without necessity and/or prevented from attending school (Scanni & Bonifazi, 2008; Sciscione & Krause-Parello, 2007; Mumcuoglu, Meinking & Burkhart, 2006; Schoessler, 2004) and culminating in school desertion (Chouela, 1997). Studies show that the population in general, including teachers, believes that the louse can fly, jump and transmit diseases (Silva, Alencar & Madeira, 2008). In many countries, the programs to prepare elementary school teachers present deficiencies in relation to health-related subjects (Leonello & L'Abbate, 2006) and, consequently, the students also do not know how the lice live or their habits. The information received is characterized by fright and prejudice against pediculosis, which is widespread among the population herein studied.

Given how the lack of knowledge of the parasite hampers the success in correct management and treatment (Sidoti et al., 2009) of the infestation, the school could be an apt setting to teach citizens about the prevention and control of pediculosis (Silva, Alencar & Madeira, 2008). Obtainment of information on the particularities of parents, who may or may not come to favor such health interventions, can aid in the development of instruction, as well as provide practical actions to diminish customs that hamper the control of pediculosis. To the best of our knowledge, there is no other published study on instruction about pediculosis and its effect in conjunction with the evaluation of these aspects by the parents.

## The aim of the study

The present study intends to ascertain the opinion of parents on the pediculosis instruction offered to their children in school, considering whether they support the activity and whether the instruction had a repercussion on the family as to the perception and taking of actions in relation to infestation.

## Methodology

### Retrospective Study

Students from two public schools in the city of Botucatu/Sao Paulo state, Brazil (N=330), enrolled in the third and fourth grade (total of 11 classrooms), received education on head lice during 45 days, approximately 1 hour per week. In this period, they were administered classes and completed activities contained in a booklet elaborated with the supervision of teachers of the respective grade levels. The content was introduced into the school curriculum and was expected to function as an interactive system; the activities were distributed between instruction and practice, with the majority being in the form of games. The students could exercise the tasks at home and, in the annex, a game that would permit the student to practice the concepts with other persons, outside of school.



## Participants and Procedure

### Population and sample size

The present study was accomplished with the parents of the children, of both schools (R and F), which had the program on pediculosis. In total, 230 parents (70%) were chosen through a random drawing to participate in the research study.

### Measures

A questionnaire was elaborated with the aim of ascertaining the repercussion of pediculosis instruction on the family and the opinion of the parents on the validity of this approach in the school. In addition to the demographic inquiries, the questionnaire contained 16 questions, with the majority being of the five-point Likert type and an open-ended question entitled "suggestions". The questions covered the following categories: education as a form of prevention, influence of the school on the family and the level of satisfaction with the school.

The previous evaluation of the questions was conducted by teachers at the schools which, when needed, were revised. Some parents were also invited to participate in the analysis of the model already revised by the teachers; a total of eight persons judged the questionnaire. The gaps and doubts presented by the reviewers were considered and the adjustments defined to confirm the suitability of the instrument in order to assure the good quality of the data obtained. The present work utilized an ecological approach to take into consideration the interdependent influences (Bronfenbrenner, 1986) exercised by the family, school, colleagues and teachers in relation to pediculosis.

### Ethical Considerations

Those responsible for the children were invited to participate in the study by means of a letter, delivered by each student integrated into the program. Together with the letter was a document of free and informed consent to be signed to indicate agreement to participate. The anonymity of the respondent as well as the student was assured. The parents who returned the signed consent form received a self-reported questionnaire.

It was requested that the parents return their completed questionnaires within one week after receipt. But when not returned by that seven-day deadline, a new request was made to turn in the responses within the next seven days, after which those who had not responded were considered to have refused participation.

## Data analysis

### Procedure

Hierarchical log linear analysis was used to analyze the data set with backwards elimination. A backwards elimination was used to remove non-significant interactions between variables; SPSS-16.0 [SPSS Inc., Chicago, IL, USA] was used to assess statistical significance ( $p < 0.05$ ). For statistical purposes, we decided to simplify all variables in dichotomous categories since most of the responses divided into two possible outcomes ("agree strongly / agree" or "disagree / disagree completely"), which were converted into a binary variable to avoid the loss of important information; the responses "don't know" and "no answer" were recorded as missing. Two-way frequency tables were analyzed by means of Pearson's Chi-square test, while the odds ratio and the p value were evaluated by univariate analysis. All two-way contingency tables between the variables were utilized whenever expected frequencies exceeded five. The tests to verify the suitability of the instrument were the test of Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity. The reliability of the questionnaire was calculated by means of Cronbach's alpha.

## Results

The sample size was sufficient for the performance of factorial analysis according to the Kaiser-Meyer-Olkin Measure of Sampling Adequacy 0.76. Likewise, the factorial analysis showed that the questionnaire structure makes intuitive sense, in accordance with Bartlett's Test of Sphericity and chi-square  $(190) = 769.44$   $p < 0.001$ , indicating the presence of internal consistency of the scales and the absence multicollinearity, as demonstrated by the determinant of the correlation matrix (0.0019). The reliability of the questionnaire, obtained by calculation of Cronbach's alpha, was 0.896.

At random, 200 parents were chosen to participate in the research and received the questionnaire, of which, 155 (77.54%) responded to it, including 65% from school R and 68.7%, from school F. It should be emphasized that, in this case, the minimum sample size to obtain a 95% confidence interval for 132 respondents, is  $N=155$  is consistent, as mentioned above, with the statistically obtained prediction.

Table 1 represents the independent variables utilized in the study and their percentages in relation to each school. There were more woman respondents 127 (84.7%) and 5 (3.2%) not answers this item. The majority of the respondents was the parents of the students (89.9%); most had completed elementary education (70.3%) and were living with five or more persons in the household (60.7%). Of the total, 83.2% affirmed that the children had suffered at least one infestation during the school year. These variables did not differ statistically in relation to responses about school.

The loglinear analysis produced a final model in which the likelihood ratio was chi-square  $(0) = 0$ ,  $p=1$ . The presence of an association between the variables, ascertained by means of the model showed that eight of them were significant, and that some of their interactions helped account for the data distribution (Table 2). The odds ratio, in turn, was calculated by the contingency table for the variable "Presence of Infestation in the Student" in relation to the variables that were significant in the loglinear analysis (Table 3).





Affirmation of the occurrence of pediculosis cases in the school, by the parents or guardians of students infested at least once during the school year, was 4.6 times greater than among those responsible for students that had not presented infestation. Likewise, the students that had lice exerted 4.4-fold greater influence over the family in relation to measures that can be taken to control lice in relation to non-infested children. The act of showing the notebook of activities, received by all the students, to a parent or guardian was associated with 3.5-fold greater pleasure in learning. The occurrence of infestation was associated with fine-tooth comb activity, which had been taught as being necessary to be applied at least one time per week. The group of those responsible for children that had suffered infestation observed the children performing the notebook activities 2.5 times more frequently than non-infested. In this group the frequency at which the student showed this notebook to parents was three times greater, besides being the subjects who most often observed the children executing its tasks.

Other results observed, for which the statistical analysis showed the absence of significant differences, but that they are important for highlighting the effect of education, are displayed in Table 4, where the variables were compared in relation to the presence of pediculosis in the school. There was near unanimity among those responsible (99.3%) as to support for pediculosis instruction in the school environment and satisfaction with the school for addressing the subject (97.9%). For the question with respect to the procurement of information from other sources, 76.4% of the respondents responded affirmatively that they had made such a search. Slightly more than half of those interviewed stated that the students performed the practical activities proposed in the notebook, influenced the family on the measures to be taken to combat pediculosis and, finally, imputed that the lice instruction had contributed to increasing their children's interest in going to school.

## Discussion

The data support the evidence finding that the pediculosis instruction awakened interest on the part of the parents, indicating that the topic is relevant to the sampled community. The present study suggests that it is possible to bring the school and family members closer together by means of instruction conducted in the classroom and that the program was found to have a positive influence. Some factors may have contributed to these results: for the parents interviewed; the presence of lice caused embarrassment; they believe that head lice could be a vector of pathogens while the population believes that the problem of head lice should be resolved at home, as indicated in a prior study performed in the same region (Silva, Alencar & Madeira, 2008). Given the day-to-day presence of this subject in daily life, this school-family connection was achieved successfully. The data suggest that some themes that most affect the children became more evident: those that had infestation informed parents or guardians about the measures for avoiding and treating pediculosis four times more frequently than those not infested, thus indicating the possibility of reaching the family through the student when the instruction manages to reach the reality lived by him or her.

Another difference in the instruction was its not having been centered only on knowledge, attitudes and practices; there was a component referring to social relations, in which the infested persons should not be despised and vanished from the school, but rather receive support that might help them overcome pediculosis. Probably, nonstigmatization also contributes to the union between the school and non-school environments. The data allow us to affirm that the student, when not feeling blamed or having self-esteem affected, was able to converse with family members on the subject, thus enabling the parents to internalize the instruction. During the elaboration and execution of our program, one of the objectives was to develop values linked to social relationships, which also must be part of the health plan in the schools (Bronfenbrenner, 1986); the results obtained herein suggest that such values contributed positively.

The communication between the children and their parents or guardians took the instruction beyond the classroom and ensured the involvement of the parents. Such involvement permitted the creation of an atmosphere supportive to healthy behaviors favorable to the taking of measures against pediculosis. The affirmation from parents that they had witnessed their children executing the fine-tooth-comb activity was associated with information on such measures as how to deal with the parasite, thus indicating that the children were capable of conducting a dialog within the family. Such dialoging is evaluated as one of the promoters of optimum family functioning (Ten Dam, 2002). The data obtained support the theory that health education in the school is able to foster school connectedness (Jackson et al., 1998).

It is also worth emphasizing the importance of the participation of educators for the success of this rapprochement. Several studies have demonstrated that when the teachers believe in the intervention and are enthusiastic about the program, acceptance by the students is greater (Rowe, Stewart & Patterson, 2007; Helitzer et al., 1999). In the present study, there was no question relative to the performance of the teachers, but, indirectly, the satisfaction of the parents with the school (97.9%) and the fact that the students had enjoyed learning about lice (79.9%) are strong indicators of the contribution of the senior-level educators to these numbers.

The elaboration of the student notebook included the participation of a group of teachers who later utilized this material in their classes. This may have contributed to a situation in which they did not feel alienated from the content and may have helped in achieving a good process intervention. Furthermore, the training time was adequate and support materials were distributed to all the teachers involved, which can be adjusted in the execution of the program. Teachers can be an agent of change in relation to infestation and its resultant problems; it was observed that in schools where the teachers did not provide information on the prevention and control of pediculosis, its prevalence was higher than in places where such facts were provided (Paredes et al., 1997). In our study, there was a decline in infestation after the current program according to non-systematized information from the teachers and parents.

For children, pediculosis is a two-fold problem, first on account of the louse itself and second due to persons who hold preconceptions on the subject (Silva, Alencar & Madeira, 2008); in other words, beyond the strictly physical action of the



louse, the psychological component can act to destabilize the school environment and possibly compromise learning. Combining the programs that aim to promote health within the school curriculum, in the present case through science instruction, is a form capable of aiding the students to comprehend the real world in which they live (Fourez, 2003).

The Limitations of this study could be the ability to generalize our findings is restricted to schools in which pediculosis is a problem for the students, teachers and parents, being limited to societies that perceive this infestation as something important that needs to be combated.

Only parents from the two schools were interviewed since these were the locations where the pediculosis program was developed with the students. This rendered the sample small but sufficiently large to encompass the universe of the parents involved.

The statistical analysis was accomplished by transforming the continuous variables into binary categories, which may have caused some loss of information. Findings from this study are sufficiently important to justify further work in a greater number of schools. The instruction reached, besides the students, their families, without enlarging the role of teachers in educating the parents or provoking antagonism between the family and the school. The instruction on pediculosis in the school was employed to bridge the gap between the theoretical and the practical, a harmonization that is required in health education. Pediculosis is part of the day-to-day life of schoolchildren in various parts of the world. For the problem to be resolved, it is necessary to obtain the collaboration of their parents and guardians, since eventual conflicts between those involved harm, principally, the children. Thus, the present study has been delineated to aid students and teachers in combating pediculosis through understanding the biology of the insect, and to identify the strong and weak points favorable to the persistence of the infestation in the school. This program reaches the families without incurring costs or other burdens to the school or to the students.

## Conclusion

Findings from this study are sufficiently important to justify further work in a greater number of schools. The instruction reached, besides the students, their families, without enlarging the role of teachers in educating the parents or provoking antagonism between the family and the school. The instruction on pediculosis in the school was employed to bridge the gap between the theoretical and the practical, a harmonization that is required in health education.

## Ethical considerations

The protocol was approved by the Research Ethics Committee, UNESP School of Medicine (Of.345-CEP).

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TABLE 1: Demographic characteristics of participants in relation to school and compared by chi square test and significance values.

ITEM	SCHOOL R N (%)	SCHOOL F N (%)	TOTAL N (%)	Chi square	p value
Respondents				0.16	0.70
Parents	42 (91.3)	82 (89,1)	124 (89.9)		
Others	4 (6.7)	10 (10.9)	14 (10.1)		
Formal Education Level				2.34	0.13
Fundamental	37 (78.7)	65 (63.3)	102 (70.3)		
Secondary to High	10 (21.3)	33 (33.7)	43 (29.3)		
Number of persons in household				0.01	0.91
≤4	18 (30.5)	33(36.3)	59 (39.3)		
≥5	33 (69.5)	58 (63.7)	91 (60.7)		
Pediculosis				1.08	0.30
Present	41 (78.8)	88 (85.5)	129 (83.2)		
Absent	11 (21.2)	15 (14.6)	26 (16.8)		



TABLE 2: Final Saturated Loglinear Model with 8 retained variables (155 weighted cases).

MAIN EFFECTS	Chi square	p value
Lice	69.52	<0.001
Presence in school	108.82	<0.001
Comb activity	39.28	<0.001
Interest in learning	39.27	<0.001
Informed of measures	36.83	<0.001
Showed notebook	36.83	<0.001
Performed activities	25.94	<0.001
Number persons in the household	5.2	<0.05
Showed notebook* Performed activities	26.88	<0.001
Performed activities*Comb activity	14.78	<0.001
Interest in learning*Comb activity	5.88	<0.05
Comb activity*Informed of measures	5.15	<0.05
Showed notebook*Interest in learning	4.83	<0.05
Comb activity*Presence in school	4.42	<0.05
Informed of measures*Lice	4.27	<0.05
Number person in the household*Lice	3.95	<0.05

TABLE 3: Univariate analysis of variables incorporated into hierarchical log linear model, relationships between presence of infestation and factors: Chi square values, p value, odds ratios, and 95% CI.

FACTORS	Chi square	p value	Odds ratio	95% CI
Enjoyed learning	7.43	<0.01	3.5	1.37:8.95
Comb activity	6.2	<0.05	3.38	1.25:9.17
Showed notebook	7.18	<0.01	3.28	1.33:8.08
Saw performing activity	4.3	<0.05	2.51	1.03:6.63
Influenced family	12.1	0.001	4.41	1.83:10.63
Lice exist in the school	7.63	<0.01	4.62	1.25:16.9
N° residents	5.1	<0.05	0.26	0.08:0.90





TABLE 4: Distribution of affirmative responses (%) and chi square test and significance according to presence of infestation.

FACTORS	N (%)	X <sup>2</sup>	p
Important to teach about lice	144 (99.3)	0.20	NS
Satisfaction with school instruction	141 (97.9)	0.55	NS
Willingness to learn more	116 (76.3)	2.07	NS
Increased interest in going to school	77 (52.0)	0.44	NS
Sought information beyond what was brought	113 (76.4)	3.04	NS
Grew to know more about lice	139 (90.8)	0.22	NS
School gives presentation on lice to parents	138 (93.9)	2.3	NS
Would participate in the presentation	104 (72.7)	0.24	NS

