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Prevalence and Risk Factors for Head Lice Infestation at Kaima Sunday School Children, Kauditan District, and North Minahasa Regency

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Abstract **Original Research Article**

The majority of head lice infestations occur in children, which results in social, economic and psychological impacts. Patients with louse infestation tend to experience psychological problems such as feeling ashamed, low self-esteem, isolated, fearful, and even frustrated due to the stigma of society that considers head lice infestation is synonymous with poor hygiene, poverty, and in children it is associated with a lack of attention from the sufferer's parents. Head lice are blood-sucking insects with a specific host that lives on the human head. This parasite cannot live outside the head for more than a certain period of time, because it must get food from the blood of its host. The prevalence of head lice infestation is still occurring throughout the world, especially developing countries. This study aims to identify the prevalence and factors causing head lice infestation in elementary school children. The research method is an analytical survey of Sunday school children in the village of Kaima, Kauditan District. After getting permission from the parents, children who met the inclusion criteria were examined with a fine comb and manually brushed the child's hair systematically from the temporal part of one side of the head to the other side. The examination was carried out on 99 Sunday school children consisting of 51 boys and 48 girls. The total number of children infected with head lice was 39 children (39.80 percent). Among the number of children infested, the girls amounted to 74.36% (29 children). Several factors were examined related to head lice infestation, namely gender, hair length, number of siblings, parental income, and parental education. Factors that were significantly related to head lice infestation were gender (p=000), hair length (p-0.009) and parental income (p=0.000). As conclusion, the prevalence of head lice infestation is still high with several risk factors. Management of the infestation needs to be done thoroughly by taking into account the existing risk factors.

Keywords: Prevalence, head lice, children.

INTRODUCTION

The prevalence of head lice infestation (Pediculosis capitis) is quite high in several countries, both developed and developing countries, such as in the United States where head lice attack 6 to 12 million people annually 1 (Brags, 2019). places, in Turkey 69.5% and Libya 78.6% (Bartosil, 2015). In developing countries, such as Malaysia and Thailand, the prevalence is 35% and 23.48%, respectively, while in Indonesia alone it is estimated that 15% of children of learning age experience this infestation of pediculosis capitis (Sari, 2016). Research on 568 people in ten orphanages in North Sulawesi showed a prevalence of 18.7%, indicating a fairly high number and need for mitigation efforts (Ruampakk, 2014). The latest data taken on Sunday school children in the village of Kawiley, showed that more than 80 percent of the children examined were infested with head lice (Wungouw *et al*., 2019).

Itching is the most common symptom of head lice infestation, where the incubation period before symptoms occur in 4-6 weeks. This itching is the result of sensitization to lice saliva and fecal antigens. Head lice bites can result in erythema, macules and papules. Itching can be very intense and can lead to excoriation accompanied by bacterial infestation (Leung, 2005). The definitive diagnosis of head lice infestation is the finding of adult head lice, nymphs and eggs in the hair and scalp (Nutason, 2008). Inspection of head lice can be done visually, but because head lice avoid light and move quickly about 6-30 centimeters per minute, the use of a razor comb to get adult lice is 4 times more effective and 2 times faster than visual inspection (Leung, 2005). The presence of adult head lice and eggs

about 0.7 cm from the scalp indicates an active infection. (Nutanson, 2008). Tools that can be used for head lice inspection are Wood Lamp and Demoscopy. Wood's lamp shows a yellow-green fluorescence of adult head lice and eggs. Head lice can remain attached to the hair for up to 6 months, so that it can be clearly seen in dark hair, with an average hair length growth of 1 cm per month. Some diseases with the same symptoms as Pediculosis capitis are seborrheic dermatitis, psoriasis, insect bites, eczema, fungal infections or possibly debris from material that hardening the hair (Brags, 2019).

The main treatment methods used to eradicate head lice are divided into two methods, namely physical and chemical. Physical methods that can be done such as combing hair or shaving shorter hair in order to prevent head lice infestation and so that topical drugs work optimally. Chemical methods are carried out using pesticides or pediculosides. Chemicals are very easy, effective and convenient to use to kill head lice, but have the potential to have side effects and resistance. Handling can also be applied in three basic effective ways, namely the use of topical pediculosid, combs when hair is wet, and oral therapy (Nutason, 2008).

Several factor have been stated as risk factors for lice infestation. Those factors including parents education level, using hair stuff together, hygiene, numbers of siblings (Nindia, 20166; Doroogar, 2014). This study want to explore the prevalence and risk factors of head lice infestation.

METHOD

This research is an analytical survey with a cross-sectional approach. Respondents are GMIM Kaima Sunday school children. A complete explanation given to the parents or guardians of the children that will be involved in this research. Demographic data for children who met the criteria were collected from parents/guardians along with several questions related to factors that associated with the incidence of head lice infestation. Examiners wear gloves, masks and head coverings. Then the examination is carried out by tracing the hair of the head starting from the parietal area, right to left, carefully parting the hair, if necessary using a magnifying glass to see evidence of head lice infestation. The diagnosis is established when there is at least 1 head louse, both nymph and adult stages, and or at least 1 head louse egg. Observations were recorded and data collected to be processed and tabulated, analyzed and reported.

RESULTS AND DISCUSSION

Respondents who met the requirements in this study are 99 children, of which 39 children were infested with head lice (39.8 percent). This prevalence is quite high and supports previous reports which state that in rural areas such as Kaima Village, the prevalence is still quite high (Munusamy).

Overall there were 51 boys (51.02%) compared to 48 girls (48.98%) who participated in the study. Head lice infestation occurred in 29 girls and 10 boys. Based on gender, girls are still show a higher percentage of head lice infestation than boys. This is supported by studies which also report that girls are the majority of the population affected by head lice infestation (Suweta, 2021; Gulgun *et al*., 2013). Head lice infestations are also still reported in various places in the world which indicates that this disease still occurs in both developed and developing countries.

The female gender is also synonymous with having longer hair. In this study, it was found that hair length had a significant relationship with head lice infestation (p= .000). Suweta, 2021 in Badung, Bali Province recently also reported a relationship between children who were infested with head lice with hair length. This is also in line with previous report by Hardiyanti *et al.*, 2015 and Sari & Fatriyadi, 2016 that long hair is one of the risk factors for head lice infestation. Long hair makes it easier for head lice to live and reproduce. Gulgun expressed the opposite opinion from his research because it did not show a significant relationship. The standard of hair length needs uniformity in determining it as a risk factor, so that this criterion can be used more universally.

Parent's income is divided into two groups, namely 2 million and more than 2 million. There are 46% of respondents with parental income of less than 2 million and another 53% have parents with income of more than 2 million. The average income of parents is 4.2 million. This study proves that there is a relationship between head lice infestation and parental income (p=0.015). A high economic level is associated with adequate housing and hygiene so that the risk of contact and transmission of infestation can be minimized. However, there are research results that disagree with this finding regarding the income of parents with the presence of head lice infestation. Munusamy reported that there was no relationship between parents' income and head lice infestation.

Table-1: Significant Risk factor

Risk Factors	p Value
Gender	0.00
Number of Sibling	0.28
Parents Education level	0.062
Parent Income	0.015
The length of hair	0.00

Mother's education level, consisting of elementary, high school and undergraduate. Parents education level is mostly at the high school level, which is 90%. Statistically there is no significant relationship between education level and head lice infestation.

Research from Wungouw (2020) and Munusamy et al also reported the same thing. The prevalence of head lice infestation can occur at all levels of parental education.

The reported prevalence of head lice infestations remains high so that treatment efforts still need to be done because although head lice infestations are not life threatening, they have a broad impact physically, psychologically, socially on infested children and their families.

The conclusion is the prevalence of heat lice infestation is still high, significant risk factors are gender, hair length and parental income. Treatment needs to be continued to overcome this disease.

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