

Study of prevalence of Head Lice (*Pediculus Humanus Capitis*) Among Schoolchildren in the Zawiya Region, Libya

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Abstract: -Head lice are external parasitic insects, obligatory parasitism on humans, and their presence is widespread in all countries of the world. It affects children and adults, and children are more affected, and girls are more affected than boys. The sample size was about 3795 male and female students, with an average of 292 male and female students in each school. The percentage of boys was 52%, compared to 48% of girls. The number of people infected with the head lice parasite reached 232 male and female patients, representing a rate of 6.1%. While the number of male students infected with the head lice parasite reached 86 boys, out of the total number of boys, numbering 2,115 students, and their percentage was 4%, while the number of girls infected with the head lice parasite reached 146, out of the total number of girls, numbering 1,448 girls, and their percentage was 10% girls infected with head lice. Head. The highest infection rate in one of the schools was 32%, while the percentages in the rest of the schools ranged from 1% to 9%. The infection rate in the first semester was 9%, while in the second semester the percentage was 6.4%, while in the third semester the infection rate was 6.3%, while in the fourth semester the percentage was 6.2%, while the percentage of infected students in the fifth semester was 5.3%, in the semester Sixth, the percentage was 2.4%, which is considered the lowest percentage. The value of Sig = 0.000, which is less than 0.05, showed that the difference between the percentage of injuries in the years of study is a significant difference between the average of injuries and the years of study.

Keywords:- Head Lice, Humans, Infestation, Insecticides, Treatment.

I. INTRODUCTION

Human lice (*Pediculus humanus capitis*) are external parasitic insects belonging to the Lice (Phthiraptera) order. They are obligate blood-sucking insects, and humans are considered the only host of the parasite. Humanity still suffers from this parasite despite the great development that has occurred in human social and health life. Regions and countries of the world vary in the extent of the spread of head lice in those regions and countries (Sulaman et al. 2020).

Head lice are insect parasites that spend their entire lives on the host's scalp and feed on human blood, four to five times daily. Humans are the only known host of this parasite. Head

lice prefer the back of the neck and the area behind the ears, where they usually lay eggs. During her four-week life, a female louse lays between 50 and 150 eggs (Mumcuoglu et al. 2009).

Head lice are small, wingless insects. Their bodies are compressed from the ventral side and the dorsal side. They have antennae, which consist of 3 to 5 pieces. They have three legs, like other insects, and the legs end with a claw that helps them hold on to the hair well. The male is smaller in size than the female. After mating, the female lays eggs, or what are known as nits, which are oval in shape. The female lays the eggs and attaches them firmly to the base of the hair with the organic matter she secretes. The female lays eggs at a rate of 4 to 8 eggs per day, and the degree of incubation of the eggs is close to the temperature of the human body. The eggs hatch and a nymph emerges from them, feeding on human blood. The nymph has three lifespans. The generation period of head lice is about three weeks (Sulaman et al. 2020).

Head lice feed on blood several times a day and live near the scalp to maintain their body temperature. Transmission of head lice most commonly occurs through direct head-to-head contact. Head lice cannot fly or jump, but they can crawl. Pets are not considered infectious. Head lice eggs are small (about the size of a pinhead), and when a live egg is crushed between fingernails it will "pop." The presence of head lice within 6 mm of the scalp is considered highly indicative of an active infestation. Hatched and dead eggs are evidence of a recent infection, but do not pose a risk of infection. If head lice are found more than 6 mm from the scalp, this indicates a previous infestation. If live lice or eggs are present, treatment should be initiated (Frydenberg and Starr.2003).

Head lice infestation is considered very ancient, meaning thousands of years ago, as head lice were found in the hair of Egyptian and Peruvian mummy. Head lice are found in all countries of the world regardless of age, gender, race, social or economic class. Children aged 3 to 11 years have the highest incidence of infection, and infection in girls is more common, possibly due to long hair, as well as the shared exchange of brushes, clips, and other hair accessories. Head lice are transmitted by direct head-to-head contact. An infection is someone who can harbor a disease-causing organism and potentially spread the infection to others. For head lice, these hard objects include combs, brushes, hair dryers, hair accessories, bedding, helmets, and other head coverings. Transmission can occur with adult head lice,

during the nymphal stages of development, or with eggs. An infected person can transmit the infection to twenty people (Burkhart and Craig (2007).

In laboratory studies, a hair dryer has been used to dislodge nymphs and adults. The lice were easily separated from the scalp of the infected person using a regular comb, and the head lice fell to the ground or remained on the comb. Anyone who vigorously combs the hair of a person infected with head lice will see a large number of head lice present on his clothes after combing the hair of the person infected with head lice. Head lice lay eggs individually on various types of fibers, on upholstered furniture and on bedding. Although preferences exist, head lice lay eggs on all fabrics tested. In addition, there is a clear preference for laying eggs close to other eggs. It has been found that head lice prefer to lay eggs on different fabrics in the lower part, rather than the upper part (Burkhart and Craig,2007).

Pediculosis is the infestation of humans with lice. Lice, caused by the human head louse, are one of the most common parasitic infestations in humans. In the United States alone, sales of head lice treatments exceed \$240 Million annually and infestation rates range from 6 to 12 million cases annually, with 2.6 million households affected and a total of 8% of the population. There is increasing public and governmental concern due to increasing cases of head lice infestation among school children. It was first reported that head lice in both Massachusetts and Florida were resistant to the pyrethroid and permethrin insecticides (Clark. 2013).

Head lice infestation is an old and common medical problem in humans. Unfortunately, head lice infestation is linked to poor public hygiene, as the person infected with it is considered socially unacceptable, although head lice infestation occurs to a person in a normal way and sometimes the infection may occur directly, but head lice infestation in itself represents a major public health problem. Head lice infestation has been steadily increasing in all countries of the world since the mid-1960s, reaching hundreds of millions annually. Famine, wars, and population density contribute to infection, which is estimated at approximately 300 million people currently infected, and infection is not associated with severe disease (Mumcuoglu et al. 2009). (Frydenberg and Starr.2003).

Humans become infected with head lice only through contact between individuals. Social contact between children, as well as the child's attachment to his parents or nanny, are among the most common ways of contracting the infection through shared combs, combs, hats, brushes, towels, clothes, beds, or closets. Direct attachment to the head is the most common means of transmission of head lice (Mumcuoglu et al. 2009).

The presence of a group of children in the family, their sharing of beds and closets, as well as the shared use of hair combing tools, social communication with family, relatives and acquaintances, social and economic status, as well as going to school and sports clubs, are considered important factors that help in infecting head lice. Girls are two to four

times more susceptible than boys. In the United States, approximately 6-12 million people are treated annually for head lice, most of them children between the ages of 3-12 years. There have been reports of an increase in the incidence of head lice in recent years in a number of countries, including North and South America, Europe, Asia and Australia (Mumcuoglu et al. 2009).

Itching in the head is the most characteristic symptom of head lice infestation, which usually intensifies significantly after three or four weeks from the beginning of the infestation. The sting reaction is very mild and the sting can rarely be seen between the hairs. Bites can be seen, especially on the back of the neck of girls with long hair when the hair is moved to the side. In some rare cases, itching can lead to secondary impetigo infection and pyoderma. Sometimes swelling of the lymph nodes occurs (Mumcuoglu et al. 2009).

The presence of empty eggshells or dead eggs alone is not an accurate indicator of an active head lice infestation. More than 16,000 children were examined and examined, and it was found that 11-19% of them were infected with live lice and eggs, while another 22-30% were infected with lice only. If no live head lice or eggs are detected on the hair, in this case the person should be considered head lice negative, and does not need treatment. Children infected with head lice are usually more susceptible to new infections than other children who are not infected, and therefore they must be examined continuously and carefully for several days. Head lice infestation is usually diagnosed by direct visual inspection by hand, and often the diagnosis of head lice is based on the presence of head lice itself. Combing hair with a head lice comb is four to five times more effective than visual inspection. Due to the fact that head lice may remain attached to the hair for up to six months after successful treatment, it only indicates a previous, inactive infestation, while live eggs indicate an active infestation (Mumcuoglu et al. 2009).

Head lice infestation is often asymptomatic and is not pathogenic to humans, but sometimes causes skin irritation, but the importance of head lice lies in its widespread spread. In recent decades, we find that most countries in the world, such as North America, South America, Australia, Europe, and Asia, suffer from head lice infestation, and its spread is constantly increasing. As a result, combating and preventing its spread is considered necessary and extremely important. Its infection is transmitted from one person to another. If you come into contact with an infected person, especially in crowded places, it is transmitted to other people and causes them to become infected. Treating infected people is one of the most important ways to prevent and control head lice. Because when the source of the infection is controlled, its spread stops (Abbasi et al. 2023).

Today, safe insecticides are considered one of the main methods of treatment. In all countries of the world, types of insecticides are used to treat head lice. Pyrethroids are the most widely used types of insecticides. It is sold under the brand names permethrin, phenothrin, and pyrethrin. The effectiveness of these insecticides in killing head lice is achieved by disrupting the nervous system of the head lice.

Recently, due to random and incorrect use and incomplete treatment period, it has led to the emergence of head lice that are resistant to insecticides. Due to the lack of a comprehensive treatment for head lice, its spread is constantly increasing. Scientific studies indicate that the effectiveness of the pesticide permethrin has decreased from 97% and that of phenothrin from 75% to less than 15%. Therefore, it is necessary to have knowledge or information about the extent of the spread of head lice that is resistant to insecticides, in order to adopt and take the appropriate treatment. In order to avoid individuals resistant to pesticides, it is preferable to use more than one type of pesticide (Abbasi et al. 2023).

If treatment with chemical pesticides is ineffective in getting rid of head lice, the only alternative is to remove the head lice by “killing the insects” by wet combing with conditioner. This method has been found to be more effective than insecticides, with a success rate of up to 57% (Burgess.2016).

Physically effected silicone preparations (Hedrin 4% solution, Thornton & Ross) and silicone/oil mixtures (Full Marks solution, RB) were introduced in 2005 and 2006 and quickly became market leaders. It is more effective than other methods, but there is difficulty in applying it continuously, as well as difficulty in washing it off. Its mechanism of action is the formation of a layer (wall) of insulating liquid that closes the respiratory openings and thus prevents head lice from expelling water outside the body, thus causing osmotic pressure on vital organs until the intestines rupture (Burgess.2016).

Pesticides that are 100% effective in eliminating lice are those that kill all of them (eggs, nymphs, and adults). Each product has a method of use. The pesticide must be applied to dry or wet hair, left for the specified time, then rinsed well with warm water. There is no treatment that kills head lice eggs 100%, so it is necessary to repeat the treatment 7-10 days after the first treatment to kill any newly hatched nymphs. If over-the-counter products containing pyrethroids don't work, prescription-strength permethrin (5%) is unlikely to be effective either. For children ages 2 to 12, preparations containing permethrin or pyrethrin are safe. Herbal preparations may play a role, although there are anecdotal reports of their effectiveness. Head lice may live for a very short time outside the host, but routine washing of bedding and clothing is not recommended, and all members of the affected family should receive treatment at the same time (Frydenberg and Starr. 2003).

If head lice pesticides are used, wet combing is not recommended for children under 2 years of age, therefore mechanical removal of head lice using a fine-toothed comb is an alternative. The procedure is performed on wet hair using hair balm. This should be repeated daily until a few days after the last louse is found. This approach resulted in the recovery of 38% of children with treated parents (Frydenberg and Starr. 2003).

Treatment with oral trimethoprim-sulfamethoxazole (Bactrim) plus a permethrin rinse only slightly increased the cure rate (89-95%). In Australia, co-trimoxazole is only recommended when resistant head lice do not respond to other conventional treatments, possibly because Resistance of head lice to pesticides. Ivermectin has also been investigated for treating head lice resistant to conventional pesticides, but has not been approved for treating head lice. Alternative Treatments There are many "natural" treatments available to treat head lice, including herbal remedies containing tea tree and others. Oils, home remedies, and electrocution using battery-operated combs. There are few studies evaluating the safety or effectiveness of these treatments, although many reports exist. Head shaving is only effective for a short time and is often unacceptable and extremely painful for children. Applying olive oil or other sticky substances heavily to the scalp and hair may suffocate head lice (Frydenberg and Starr.2003).

Currently there are many different products used to treat head lice, which can be divided into two main groups, chemical and physical. Physical methods include combing with “lice combs” (one method is known as “pest control”), and using electronic combs (such as the Robicomb). Their uses are increasing due to the desire of parents not to use chemicals, and also due to the lack of effectiveness of the chemicals used in treating head lice. Treatment methods currently available include chemotherapy, topical treatments (herbal remedies and treatments containing pyrethrin, permethrin, carbaryl, lindane, or malathion), and oral treatments such as ivermectin and cotrimoxazole (James.2003).

There is some evidence indicating that wet combing with conditioner can be the most effective diagnostic method, but dry combing using a head lice comb in detecting head lice is considered the best and fastest way to detect and find head lice (Burgess.2016).

Al-Zawiya is located west of Tripoli, 51 km away from it, at longitude 12.72 east and latitude 32.75. Its area is about 2,753 square kilometers, and the population is about 270,751 people, representing 5.11% of the total population in the State of Libya (General Information). Authority.2006), (Halila.2021).

➤ Importance

Humans, like other living organisms, are susceptible to infection with many internal or external parasites. Head lice is one of the most important external parasites that infect humans. Head lice are small insects that live and feed on blood in the human scalp. It is spread through direct and indirect transmission from an infected person to a healthy person, using his own tools, such as his comb, head coverings, bedding, or special covers. It is widespread in all countries of the world, infecting millions of people, especially children, regardless of social or economic level. It is most common in children, especially during school, and in turn, it spreads it to his family and those around him. The presence of lice on the head can be noticed by noticing itching, or by combing hair wet with water with a lice comb, or by seeing the eggs (nits)

firmly attached to the hair, taking care to comb the hair strand from the scalp to the ends of the hair. Infection with a head lice causes severe itching in the head or causes movement in the head that distracts the student's attention and concentration during the lesson. It also causes sleep disturbances, and all of this affects his academic achievement. Also, the student infected with head lice is avoided by friends and colleagues, causing him isolation and introversion, which may affect it's in his behavior.

➤ *Objectives of the Study*

This study aims to do the following:

- Study the spread of head lice among school children in the study area.
- Public awareness of head lice, the causes of its spread, its harms and effects, and ways to combat it and reduce its infestation, especially among school children.
- Educating the community about the importance of studying head lice, knowing its life cycle, ways of spreading it, and ways to combat it.
- Transferring a picture of reality to the relevant authorities, in order to limit or minimize the infection, in cooperation between the school administration and parents.
- Guidance, counseling and advice for male and female students and their families. Emphasizing the application of general and personal hygiene rules because of their positive impact in reducing and reducing infection.

II. MATERIALS AND RESEARCH METHODS

The survey method is considered one of the most important methods used to collect scientific material used by researchers in their various scientific specializations, as researchers use a questionnaire sheet that is distributed to respondents who are related to the research.

A questionnaire sheet was conducted explaining everything related to the number of students (males and females) as well as the number of students infected with lice in the various stages of primary school. Grade (first, second, third, fourth, fifth and sixth).

A questionnaire sheet was distributed to a group of (14) schools in the study area (Al-Zawiya) for the academic year 2023/2024. One school was excluded due to inaccuracy of the data (because the subject of the study is sensitive to the majority of society). The researcher was keen for the data to be very accurate. The data provided by the school will be provided without mentioning the name of the school. The questionnaire was filled out by the school administration based on the records. Periodic detection and inspection of head lice is carried out by the school administration through the school health supervisor.

After collecting the samples, the data obtained from the questionnaire sheet is analyzed using the famous program SPSS (Statistical Package for Social Sciences).

III. RESULTS AND DISCUSSION

➤ *After Collecting the Data and Analyzing it Statistically, the Following Results were Obtained:*

- The number of the study population was thirteen schools, including two schools for male students, while the rest of the schools, which numbered eleven, were mixed schools (males and females). The total number of all students, that is, in all the schools of the study sample, was 3795 male and female students distributed over the different years of basic education, meaning an average of 292 male and female students in each school, with the lowest school having 103 male and female students and the highest school having 688 male and female students. That is, there are large differences in the number of students per school, which is due to several factors, including the location of the school, population density, as well as the area of the school and the number and area of its classrooms. There is a difference in the number of classrooms from one school to another, and it may also be due to the specific requirements for accepting a number of students for each semester.
- The total number of students in the study population is 3795 male and female students, where the number of male students is 2201 males, their percentage is 58%, and the number of female students is 1594 females, their percentage is 42%. This large difference between the two percentages is due to the presence of (2) two schools each. Her students were male. When deleting and excluding male-only schools from the sum, the total number of male students will be 1,717 male students, and thus the percentage of male students becomes 52%, compared to 48% of female students, meaning that the percentage between them is close and in favor of males.
- The number of people infected with the head lice parasite reached 232 male and female out of a total number of students of 3795, representing 6.1%. This percentage is considered higher than the 1.3% in a study conducted by the researcher (Baddour. 2011) in the State of Syria, who also indicated in the same reference that mentioned that the percentage The infection rate in Iran was 6.85%, which is slightly higher than this study, while in Korea the infection rate was 4.1%, which is lower than the percentage obtained. It was also indicated in the same reference that another study was conducted in Venezuela on 327 students and that the infection rate was It is high, at a rate of 28.8%, which can generally be explained by the low social standard in general in the country, as well as the small size of the study sample, and also due to the lack of interest, whether from the school administration or from the family. In another study in Iraq conducted by the researcher (Sulaiman et al. 2020), he stated that the incidence of head lice was 11.13%. While the number of male students infected with the head lice parasite reached 86 male students out of a total number of 2,115 male students, representing 4%, while the number of female students infected with the head lice parasite reached 146 out of a total number of 1,448 female students, and their percentage was 10% female students. Infected with head lice. From Table No. (00) we note that the Sig value =

0.000. This is evidence that the two characteristics are not independent, meaning that there is a relationship between gender and head lice infestation.

- The study showed that the rate of infection among female students is greater than the rate of infection among male students. These rates are consistent with many studies that indicate that the rate of head lice infection in females is higher than it is in males, and that this is due to several factors, including that females' hair is long. Therefore, it is more suitable for head lice, as well as the difficulty in combating and getting rid of it. Also, females may be more attached to each other than males, and the exchange of hats, head coverings, and hair ties among girls also contributes to its spread, as the results of this study are consistent with what others have found. Head lice infestation increases with hair length, as long hair provides more space for head lice compared to short hair, and cleaning and caring for short hair is easier, easier, and more effective than long hair (Baddour.2011.)
- The highest number of infestations was in School No. (13), where the number of people infected with head lice was 110 out of a total number of students, which numbered 339 male and female students, where the infection rate was 32%, and this percentage is considered a high percentage and is an anomaly compared to school rates. On the other hand, this percentage is considered less than the percentage that was in a study on the spread of lice in schools in the state of Syria conducted by the researcher (Sulaiman et al. 2020), where the highest percentage of infection in one of the schools was 42%. The high percentage of infection spread among Students in one school, which I mentioned, may be due to several factors, including the social and family circumstances of the students, and that this large spread of the head lice parasite may be caused by the strong adhesion between students in the classroom, in the school yard, or on public transportation such as buses, and this may indicate The increase in infection indicates that there is a failure to limit its spread by the school administration, the student's family, or both. The infection rate in other schools ranged from 1% to 9%.
- The total number of students is 3563 male and female students distributed across the primary levels (from the first semester to the sixth semester). The number of people infected with this parasite is 232 infected girls, male and female, distributed among the classrooms of the primary stage, where the number of people infected with the head lice parasite in the first semester is 63 infected students out of the total number of students in the first semester, 637 male and female students, and the percentage was 9%, while in the second semester the number of people infected with this parasite was 42 infected men and women out of a total number of students, numbering 614 male and female students, and the infection rate was 6.4%, while in the third semester it was The number of infections was 42 infected men and women out of a total of 661 students in the third semester, and the infection rate was 6.3%. In the fourth semester, the number of people infected with this parasite was 39 infected men and women out of the total number of students this semester, 620 male and female students, at a rate of 6.2%, while the

number of infected students was 6.2%. In the fifth semester, 31 male and female students were infected out of a total of 602 male and female students, and the infection rate with this parasite was 5.3%. In the sixth semester, the number of students of both sexes was 587, of whom 15 male and female students were infected with this parasite, and the percentage was 2.4%. From Table No. (5), the value of Sig = 0.000 was shown, which is less than 0.05. This is sufficient evidence to reject the null hypothesis, meaning that the difference between the percentage of infections in the educational levels is a significant difference between the average of infections and the years of study. We notice from the numbers that the number and percentage of infection varies according to the years of study, and that there is an inverse relationship between the infection and the years of study, meaning that the lowest percentage is in the sixth year, 2.4%, and in the first year, the infection rate was 9%, and this difference can be due to several factors, including that the student the more As he grows older, he pays more attention to his general and personal hygiene and is able to rely more on himself. The student in the first years of school, due to his young age, cannot take care of himself well, and he needs great attention and care from the family, and any negligence in the attention and care from the family, It will reflect negatively on the student's general hygiene and thus he will be more susceptible to head lice infection.

IV. CONCLUSIONS

➤ *The most Important Conclusions can be Summarized in the following Points:*

- The spread of head lice globally, even in developed countries, regardless of the gender, age, or social or economic status of the individual.
- The importance of raising awareness about head lice, whether by the family or by the school administration, contributes to reducing its spread.
- Head lice infestation affects the student in several aspects, including academic achievement, as well as students staying away from the infected person and not mingling with him, causing him isolation and loneliness, which may affect his behavior in the future.
- The incorrect use of chemical pesticides to combat head lice has led to the emergence of new individuals resistant to them.

RECOMMENDATIONS

- Children infected with head lice are not allowed to go to school or child service centers to limit its spread. After starting treatment, they can attend.
- If you notice a student constantly scratching his head, the administration must be informed of this, because there is a high possibility that he may be infected with head lice.
- Educating parents, teachers, and administration about the head lice parasite through periodic and routine inspection, especially for first-year students.

- Taking notes and recording cases of students who have head lice by writing reports about the student’s social family in order to address the causes in the future.
- Emphasizing attention to children’s general and personal hygiene, as it has a positive effect in reducing the spread of head lice.
- Conducting awareness campaigns by health supervisors in schools to address both demands and concerns, as awareness has a role in reducing head lice infection.
- Parents should pay close attention to the cleanliness of their children, especially during the school period,

because during the school period there is a lot of mixing between students.

- Periodic and continuous detection of head lice throughout the school period, and that detection begins at the beginning of the school year, and that detection is intensified in schools where head lice infestation is widespread.

➤ *List of Tables and Figures*

Table 1 Shows the Number of Female and Male Students and their Percentage

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Male	2201	58.0	58.0	58.0
Female	1594	42.0	42.0	100.0
Total	3795	100.0	100.0	

Table 2 Shows the Number and Percentage of School Students in each School

Schools	Frequency	Percent	Valid Percent	Cumulative Percent
School (1)	118	3.1	3.1	3.1
School (2)	117	3.1	3.1	6.2
School (3)	113	3.0	3.0	9.2
School (4)	360	9.5	9.5	18.7
School (5)	153	4.0	4.0	22.7
School (6)	688	18.1	18.1	40.8
School (7)	240	6.3	6.3	47.1
School (8)	142	3.7	3.7	50.9
School (9)	601	15.8	15.8	66.7
School (10)	465	12.3	12.3	79.0
School (11)	103	2.7	2.7	81.7
School (12)	246	6.5	6.5	88.2
School (13)	449	11.8	11.8	100.0
Total	3795	100.0	100.0	

Table 3 Shows the Number and Percentage of Students in the Different Stages of School Years

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
First Year	673	17.7	17.7	17.7
Second Year	656	17.3	17.3	35.0
Third Year	661	17.4	17.4	52.4
Fourth Year	620	16.3	16.3	68.8
Fifth Year	583	15.4	15.4	84.1
Sixth Year	602	15.9	15.9	100.0
Total	3795	100.0	100.0	

Table 4 Shows the Number of Male and Female Students in the Stages of School Years

	Sex		Total
	Male	Female	
First Year	392	281	673
Second Year	364	292	656
Third Year	388	273	661
Fourth Year	359	261	620
Fifth Year	348	235	583
Sixth Year	350	252	602
Total	2201	1594	3795

Table 5 Number and Percentage of Head Lice Infestations

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Uninfected	3563	93.9	93.9	93.9
Infected	232	6.1	6.1	100.0
Total	3795	100.0	100.0	

Table 6 Shows the percentage of head lice infestation and years of study

	Year of Study						Total
	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Sixth Year	
Uninfected	610	614	619	581	552	587	3563
Infected	63	42	42	39	31	15	232
Total	673	656	661	620	583	602	3795
Incidence Rate	9%	6.4%	6.3%	6.2%	5.3%	2.4%	6.1%

Table 7 Shows the Number and Percentages of Both male and Female Students

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	2201	58.0	58.0	58.0
Female	1594	42.0	42.0	100.0
Total	3795	100.0	100.0	

Table 8 Shows the Number of Students and the Infection Rate

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Uninfected	3563	93.9	93.9	93.3
Infected	232	6.1	6.1	100.0
Total	3795	100.0	100.0	

Table 9 Shows the Number and Percentage of Infections in Both Males and Females

	Sex		Total
	Male	Female	
Uninfected	2115	1448	3563
Infected	86	146	232
Total	2201	1594	3795
Incidence rate	3.9%	9.1%	6.1%

Table 10 Shows the Number and Percentage of Infections in each School

Schools	Injury			Total
	Uninfected	Infected	Incidence rate	
School (1)	109	9	%7.6	118
School (2)	107	10	%8.5	117
School (3)	101	12	%10.6	113
School (4)	347	13	%3.6	360
School (5)	151	2	%1.3	153
School (6)	679	9	%1.3	688
School (7)	238	2	%8	240
School (8)	139	3	%2.1	142
School (9)	565	36	%6	601
School (10)	443	22	%4.4	465
School (11)	102	1	%0.97	103
School (12)	243	3	%1.2	246
School (13)	339	110	%2.4	449
Total	3563	232	%6.1	3795

Table 10 Test of Homogeneity of Variances Injury

Levene Statistic	df1	df2	Sig.
120.841	12	3782	000.

Table 11 Shows the ANOVA Injury Analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	19.518	12	1.627	31.021	.000.
Within Groups	198.299	3782	.052.		
total	217.817	3794			

Table 12 Shows the Test of the Descriptive Variable (Sex and Injury (Sex * Injury Crosstabulation))

		Injury		Total
		Uninfected	Infected	
Sex	Male	2115	86	2201
	Female	1448	146	1594
Total		3563	232	3795

Table 13 Shows the Test of the Descriptive Variable (Sex and Injury(Chi-Square Tests))

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	44.429 ^a	1	.000		
Continuity Correction ^b	43.519	1	.000		
Likelihood Ratio	43.792	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	44.418	1	.000		
N of Valid Cases	3795				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 97.45.

b. Computed only for a 2x2 table

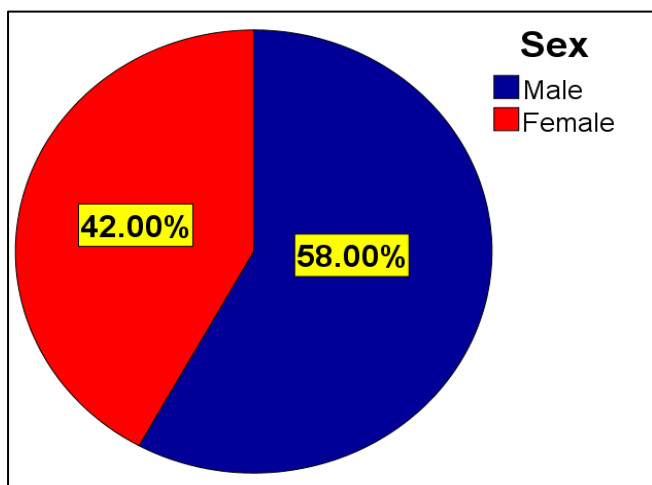


Fig 1 Shows the Percentage of Males and Females

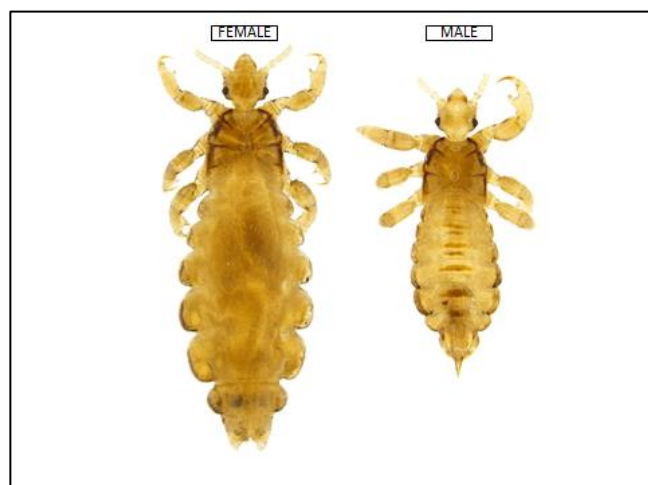


Fig 2 Shows Head Lice (Male and Female)) Salvador.2022)

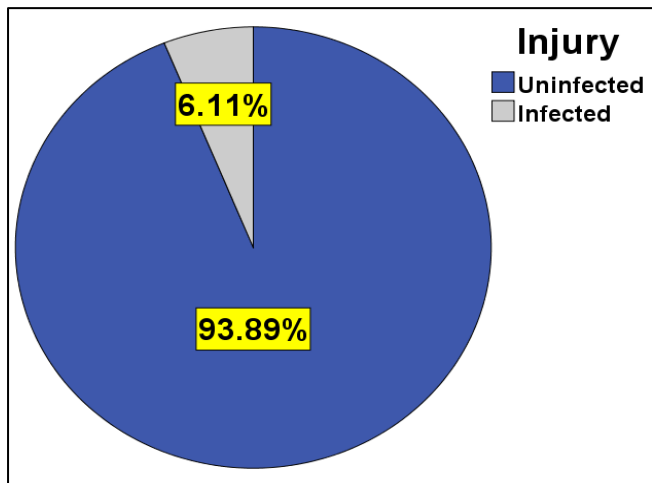


Fig 2 Shows the Rate of Head Lice Infestation

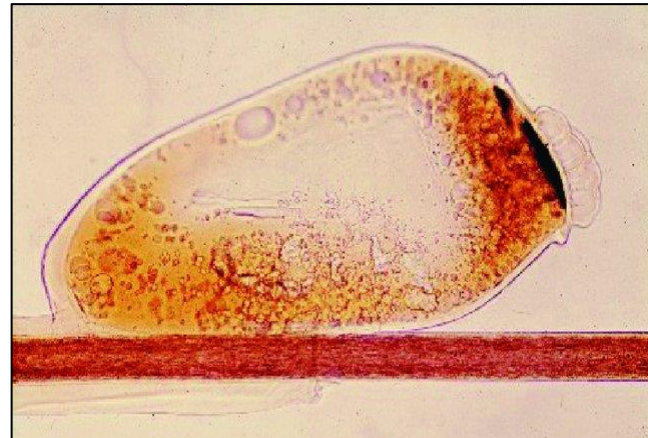


Fig 3 Shows a Head Lice Egg. Live Eggs are Round, Transparent, Shiny, and Whitish-Pink in Color. Figure 2. Head louse egg. Living Eggs

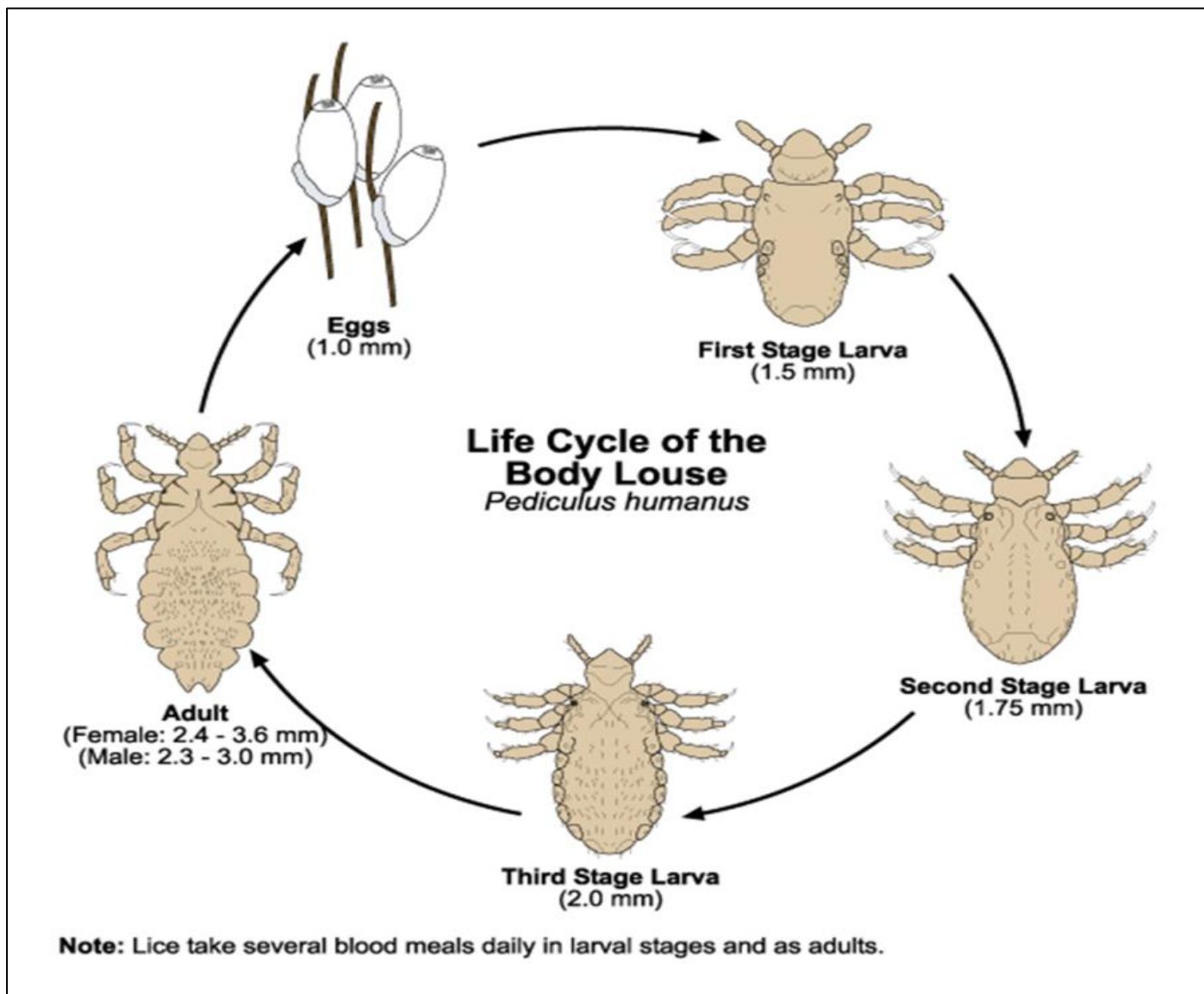


Fig 4 Shows the Life Cycle of Head Lice (Mullen and Durden. 2002)

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