

## Identification of Ancylostoma Duodenale Eggs in Pregnant women with Anemia at Kusuma Bangsa Community Health Center, Pekalongan City

Abdul Ghofur<sup>1</sup>, Miladia Nisa' Kamilya<sup>1</sup>

<sup>1</sup>Akademi Analis Kesehatan Pekalongan, Pekalongan, Indonesia

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#### Corresponding Author :

Miladia Nisa' Kamilya

E-mail :

[miladianisa.k@gmail.com](mailto:miladianisa.k@gmail.com)

### ABSTRACT

**Background & Objective:** Helminthiasis is a public health problem that can affect nutritional status and cause anemia, especially in vulnerable groups such as pregnant women. One type of worm that plays a role in anemia is *Ancylostoma duodenale*, which lives in the small intestine and can cause chronic blood loss. This study aimed to identify *Ancylostoma duodenale* eggs in pregnant women with anemia at Kusuma Bangsa Health Center, Pekalongan City. **Method:** This study used a descriptive design with a sample of 11 pregnant women with anemia at the Kusuma Bangsa Community Health Center, Pekalongan City. *Ancylostoma duodenale* eggs were examined using sedimentation method. **Result:** The examination results showed that all samples were negative for *Ancylostoma duodenale* worm infection. Factors supporting the negative results were that most respondents had implemented good personal hygiene, such as the habit of washing hands with running water, using footwear when leaving the house, always cutting nails at least once a week, and washing raw vegetables before consumption, so as to prevent transmission of helminthiasis. **Conclusion:** In conclusion, there was no *Ancylostoma duodenale* infection among pregnant women with anemia at Kusuma Bangsa Community Health Center, Pekalongan City.

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### Introduction

Helminthiasis is one of the *Neglected Tropical Diseases* (NTDs). In Indonesia, helminthiasis is one of the NTDs prioritized by the government, along with filariasis, schistosomiasis, leprosy and frambusia. Helminthiasis rarely causes direct mortality,

but it greatly affects the quality of life of the sufferer by causing a decline in health, nutrition, intelligence, and productivity (Agustina, 2022).

The most common helminthiasis in humans is caused by intestinal nematodes that are transmitted through the soil or commonly referred to as *Soil-Transmitted Helminths* (Menteri Kesehatan RI, 2017). The *World Health Organization* (World Health Organization, 2023) explains that more than 1.5 billion people, or 24% of the world's population, are infected by STH worms. Some species of STH worms that often infect humans are *Ascaris lumbricoides*, *Ancylostoma duodenale*, and *Trichuris trichiura*. Of the three species, only *Ancylostoma duodenale* is at risk of causing anemia. These worms live in the small intestine of infected humans, attach to the villi, and suck nutrients and blood from the host. In patients with inadequate iron intake and high physiological requirements, this blood loss has the potential to cause anemia (Meng *et al.*, 2018).

Anemia is a condition where the amount of hemoglobin in the blood is lower than normal, making it insufficient for the body's physiological needs. Hemoglobin itself is a protein in red blood cells that functions as a medium to deliver oxygen from the lungs to all body tissue cells (Kementrian Kesehatan RI, 2022; Mudjiati *et al.*, 2023). According to the World Health Organization, the highest prevalence of anemia occurs among women, especially pregnant women. One of the causes of maternal mortality is anemia which causes complications in pregnancy (Teja, Mastryagung and Diyu, 2021). In addition, anemia in pregnant women can lead to premature birth, low birth weight babies, and reduced iron stores in babies, which has the potential to cause anemia and inhibit cognitive, motor, sensory, and social growth in children (Wibowo, Rima and Rabbania, 2021). If not treated quickly and appropriately, chronic anemia can cause various damage to organs and end in death (Mentari and Nugraha, 2023).

The prevalence of anemic pregnant women in the world reaches 41.8%, with about half of these cases caused by iron deficiency. In Asia, the number of anemic pregnant women reaches 48.2%. For Indonesia alone, based on data from the Indonesian Health Survey (SKI) in 2023, it is known that 3 out of 10 (28%) pregnant women experience anemia, which can be exacerbated by helminthiasis, and contributes to 63.5% of neonatal deaths (Humas BKKP, 2024).

Research related to helminthiasis, especially *Ancylostoma duodenale* infection, was conducted by Yunita Armiyanti, Wiwien Sugih Utami, Yudha Nurdian, and Julie Ann S. Ng. to determine the presence of *Ancylostoma duodenale* infection, out of 277 samples of workers in 5 plantations in Jember Regency, 59 (21.3%) samples were positive (Armiyanti *et al.*, 2020). Another study was also conducted by Yunita Armiyanti, Brillian Adexa Yudinda, Heni Fatmawati, Bagus Hermansyah, and Wiwien Sugih Utami on 56 farmers in 3 villages in Jenggawah District, Jember Regency, where 4 samples (7.1%) were infected with *Ancylostoma duodenale* (Armiyanti *et al.*, 2023). Meanwhile, research conducted by Suci Wahyuningtyas, Sresta Azahra, and Agus Rudi Hartono related to *Ancylostoma duodenale* infection in 14 sand miners in Loa Janan Subdistrict, Kutai Kartanegara Regency, obtained negative results (Wahyuningtyas, Azahra and Hartono, 2022).

Based on the explanation above, further studies are still needed regarding the identification of *Ancylostoma duodenale* worm eggs in pregnant women with anemia. This is important considering that intestinal worm infection is one of the factors that can aggravate the condition of anemia in pregnant women. This study is expected to

provide useful preliminary data in the prevention of helminthiasis, especially in pregnant women.

## Objective

The purpose of this study was to identify *Ancylostoma duodenale* eggs in pregnant women with anemia at Kusuma Bangsa Community Health Center in Pekalongan City.

## Method

The type of research used is descriptive research. The population in this study were all pregnant women with anemia at the Kusuma Bangsa Health Center in Pekalongan City, totaling 11 people. The sample was taken by total sampling (census) with purposive determined based on the following criteria:

1. Inclusion Criteria
  - a. Pregnant women who suffer from anemia at the Kusuma Bangsa Health Center, Pekalongan City
  - b. Not suffering from chronic diseases that affect hemoglobin levels.
  - c. Willing to be a research respondent.
2. Exclusion Criteria
  - a. Respondents who took deworming drugs before the examination time.
  - b. Pregnant women who have recovered from anemia during the examination.
  - c. Suddenly refused to be a research respondent.

The study was conducted from September 2024 to February 2025 at Kusuma Bangsa Health Center, Pekalongan City. The sample examination used the sedimentation method. Data in this study came from primary and secondary data. Primary data were obtained through observation techniques, questionnaires, interviews, as well as the results of hemoglobin examination and identification of *Ancylostoma duodenale* eggs in the laboratory. Secondary data were obtained from research journals, official websites of the Ministry of Health and WHO, books, and medical records of pregnant women with anemia from the Kusuma Bangsa Community Health Center of Pekalongan City. The data obtained were then processed, presented descriptively in tabular form and narrated. The percentage of pregnant women with anemia who were positive for *Ancylostoma duodenale* infection was obtained from the following formula:

$$\text{Percentage positive for } Ancylostoma \text{ duodenale} = \frac{\text{Number of Positive Samples}}{\text{Total Number of Samples}} \times 100 \%$$

## Results

A study on the identification of *Ancylostoma duodenale* worm eggs in 11 samples of pregnant women with anemia at Kusuma Bangsa Community Health Center, Pekalongan City, which was conducted at the Parasitology Laboratory of Pekalongan Health Analyst Academy on January 22 - February 7, 2025, obtained the following results:

**TABLE 1.** Number and Percentage of Identification Results of *Ancylostoma duodenale* Worm Eggs in Pregnant Women with Anemia at Kusuma Bangsa Health Center, Pekalongan City

Result	Number	%
Positive	0	0
Negative	11	100
Total	11	100

Based on Table 1, the number and percentage of *Ancylostoma duodenale* eggs identification results in pregnant women with anemia at Kusuma Bangsa Health Center, Pekalongan City, from all samples were negative.

## Discussion

Based on the examination of *Ancylostoma duodenale* worm eggs in 11 samples of pregnant women with anemia at Kusuma Bangsa Health Center, Pekalongan City, all samples were negative. The results of this study are in accordance with the research conducted by Mughniy Muiz Zamroni on the identification of *Mine* sp. worm eggs in gold miners in Pancurendang Village, Ajibarang District, Banyumas Regency with the results of 20 samples, all negative (Zamroni, 2018) and research conducted by Muhammad Bibit Wisma Gumelar on intestinal nematode infection in rice field farmers who experience symptoms of anemia in Kebagusan Village, Ampelgading District with the results of 15 samples, no *Ancylostoma duodenale* infection was found (Gumelar, 2020). But the results of this study are different from the research conducted by Alifah Nurjannah Triputri, Ansariadi, and Rismayanti (Triputri, Ansariadi and Rismayanti, 2021) on helminthiasis in pregnant women in the slum area of Tallo Subdistrict, Makassar, the results showed that 11 pregnant women (15.70%) were infected with *Ancylostoma duodenale* because most of the infected respondents did not apply good personal hygiene, including the habit of washing hands, cutting nails, and wearing footwear.

Factors that can prevent *Ancylostoma duodenale* infection are good sanitation and *personal hygiene*, such as washing hands with running water before eating, always using footwear when leaving the house, cutting nails at least once a week, washing raw food before consumption, and taking deworming drugs every six months (Ideham and Pusrarawati, 2007). The influence of sanitation and *personal hygiene* factors on the negative results of the study can be explained as follows:

### 1. Sanitary Factors

The results of the questionnaire on latrine ownership showed that 10 respondents (90.91%) had proper latrines, which prevented the spread of *Ancylostoma duodenale* eggs to the environment as a potential medium of infection. Good sanitation can minimize the risk of helminthiasis. The realization of good sanitation is done by treating human waste through the use of proper latrines (Ideham and Pusrarawati, 2007; Sulasmi, Inayah and Rachman, 2024). This is in accordance with research conducted by Anggraeni Sih Prabandari, Ajeng Novita Sari, and Ardita Ferlinda Ahtamagara on intestinal nematode infections in farmers in Sukoharjo Regency, Central Java, which is related to latrine ownership, of all 31 respondents, all of them have latrines and the results of this study found only 1 respondent (3.23%) infected with *Ancylostoma duodenale* (Prabandari, Anggraeni Sih Sari and Ferlinda Ardita, 2023).

### 2. Personal Hygiene Factors

#### a. Hand Washing Habits

The results of the questionnaire on hand washing habits showed that 8 respondents (72.73%) always washed their hands with running water before eating, thus having clean hands free from *Ancylostoma duodenale* worm eggs or larvae that can contaminate from soil, feces, or other objects previously touched. With this habit, the risk of *Ancylostoma duodenale* worm infection that can occur due to eating using contaminated hands is very low (Permata, Junaidin and

Untari, 2023). This is in accordance with research conducted by Aulia Jasmine Mukti, et al. on the analysis of the relationship between hand washing and helminthiasis in elementary school-aged children in Linggasari Village, Kembaran District, Banyumas Regency, the results of which showed that 25 respondents (78.1%) had good hand washing habits and in this study no *Ancylostoma duodenale* worm infection was found (Mukti, Sari and Dwianasari, 2022).

b. Habit of Using Footwear

The results of the questionnaire related to the habit of using footwear, it is known that 10 respondents (90.91%) always use footwear when leaving the house. The use of footwear can reduce the possibility of direct contact with soil or other surfaces that may contain *Ancylostoma duodenale* worm larvae that are transmitted through the penetration of larvae on the skin of bare feet, thus reducing the potential for helminthiasis infection (Ideham and Pusarawati, 2007; Permata, Junaiddin and Untari, 2023). This is in line with research conducted by Sukmawening Chairunisa on *Soil Transmitted Helminths* in children in Krajan Hamlet, Singamerta Village, Banjarnegara, out of 30 respondents there were 28 respondents (91.3%) who always used footwear when leaving the house and in this study no *Ancylostoma duodenale* worm infection was found in respondents (Chairunisa, 2022).

c. Nail Clipping Habit

The results of the questionnaire on the habit of cutting nails showed that 9 respondents (81.82%) always cut their nails at least once a week. The habit of cutting nails regularly, at least once a week, can reduce the potential for *Ancylostoma duodenale* worm eggs to be stored under the nails which are likely to contaminate the food they touch or even directly enter the mouth (Triputri, Ansariadi and Rismayanti, 2021). This is in accordance with research on *Soil Transmitted Helminths* in children in Krajan Hamlet, Singamerta Village, Banjarnegara by Sukmawening Chairunisa, out of 30 respondents there were 26 respondents (82.6%) who cut their nails at least once a week and the results of this study did not find *Ancylostoma duodenale* worm infections (Chairunisa, 2022).

d. Raw Food Consumption

The results of the questionnaire on the consumption of raw food in the form of various types of vegetables or fresh vegetables in one week, there were 2 respondents (18.18%). However, based on further interviews, they practiced proper hygiene measures by always washing these raw foods before consumption, so they were not at risk of helminthiasis. In accordance with the theory, consuming raw food without washing can increase the risk of helminthiasis (Sarasmata, 2020). This is directly proportional to the research conducted by Alifah Nurjanah Triputri, Ansariadi, and Rismayanti on the determinants of helminthiasis in pregnant women in the slum area of Tallo District Makassar, out of 70 respondents there were 53 respondents (75.70%) who washed raw food before consumption and in this study no *Ancylostoma duodenale* worm infection was found (Triputri, Ansariadi and Rismayanti, 2021).

e. Deworming Drug Consumption

The results of the questionnaire related to the consumption of deworming drugs, it was found that all respondents (100%) did not consume deworming drugs, especially those who had entered the third trimester, because it was not

recommended by the midwife. Not taking deworming drugs every 6 months can be a risk factor that will increase the chance of being infected with helminthiasis, because routinely taking deworming drugs every 6 months is a fairly important preventive effort (Sarasmata, 2020). Although all respondents did not take deworming drugs once every 6 months, the results of the study were all negative, this was because it was supported by other factors that prevented worm infections, such as good *personal hygiene* and sanitation (Nery *et al.*, 2019). *Ancylostoma duodenale* worm infection causes anemia, but the results in this study were negative. This shows that anemia is not only caused by helminthiasis, anemia in respondents can be caused by other factors, such as malnutrition, impaired nutrient absorption, impaired iron homeostasis, or other medical factors that need further research (Mentari and Nugraha, 2023).

## Conclusion

Based on the research conducted, it can be concluded that *Ancylostoma duodenale* worm eggs were not found in 11 samples of pregnant women with anemia at Kusuma Bangsa Health Center, Pekalongan City.

Suggestions for future researchers to conduct research with molecular methods to get more valid results, as well as conduct research related to risk factors for anemia in pregnant women.

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