



RESEARCH ARTICLE

Risk Behavior of Tiom Community Related with Helminthiasis at Lanny Jaya District, Papua Province, Indonesia

Gurendro Putro^{1*}, Ristrini¹, Noor Edi Widya Sukoco¹, Erni Rosita Dewi²

¹ *Research and Development Center for Humanities and Health Management, Ministry of Health Indonesia.*

² *School of Midwifery, Faculty of Medicine, Universitas Airlangga.*

***Corresponding Author: Gurendro Putro**

Abstract

Background: Helminthiasis is an infectious disease which is one of the severe health problems in Indonesia. The worm can reduce intelligence, inhibit the growth of children, and even cause death. The behavior of a clean and healthy life is expected to be able to encourage the community to improve the quality of daily health behaviors to cope with helminthiasis. Objective: to assess risk factors in healthy hygiene behaviors that has the potential to cause helminthiasis. Method: A descriptive retrospective research. The material is interviews form and library data assessment. Data collection is done by listening, direct recording, recording audio, and video provided. Data retrieval is done by the time-limited sampling method. The data obtained were processed and analyzed descriptively. Results: It was found that the community consisted of local communities and migrants. The risk factors for clean and healthy living that have the potential to cause helminthiasis are divided into two, namely: (1) Hygiene and living environment sanitation (2) Personal hygiene and sanitation which includes; the habit of washing hands is still low, not wearing footwear, the practice of cutting nails that are still weak, open defecation habits, bathing habits that are very rarely done, drinking water and eating raw food (3) Risk of eating pork at a "barapen" stone grilling ceremony. Conclusion: Risk factors in healthy hygiene behavior that have the potential to cause helminthiasis are health sanitation of residential, inadequate personal hygiene, and cooking pork at a "barapen" stone grilling ceremony, which is considered insufficient to kill worms.

Keywords: *Clean and healthy lifestyle, Helminthiasis, Tiom, "Barapen" Ceremony, Tiom, Papua Indonesia.*

Introduction

Ethnographic health research is one way to look for data and health problems based on the health culture in the community. This research was conducted as an illustration of health conditions in an area as a basis for sustainable health policy making [1]. In 2016 ethnographic research was carried out in 25 locations in the territory of Indonesia. One of the health ethnographic research areas is Lanny Jaya Regency [2-4]. Lanny Jaya is recorded in the administrative region of the Papua Province. The total area is 6,448 km², equivalent to 2.03% of the province of Papua. In 2016, it was noted that Tiom is the district capital and the total 39 districts; there are 354 villages and sub-districts [2]. The air

temperature ranged from 15.6 °C to 19.7 °C. It is still inland.

Some of the roads are already asphalt, but most of the trips are dirt roads and small pebbles. Based on the recommendations, Tiom District was chosen as the target site for this study. Various considerations were expressed including security, socio-cultural, and the availability of electricity also provides additional capital is important for researchers to be able to do various types of records while in the research location. Health ethnographic research is one way to find data and health problems based on the community's existing health culture. This research was conducted to describe health

conditions in an area as a basis for sustainable health policy making¹. In 2016 ethnographic study was conducted in 25 locations in the territory of Indonesia.

One area of ethnographic health research is Lanny Jaya Regency. This is based on data from the Basic Health Research (Riskesdas) results in 2013, that Lanny Jaya Regency was included in the achievement of low health performance in Papua Province [2, 3, 5]. Lanny Jaya Regency is registered in the administrative area of Papua Province. The regency was approved in 2008 as part of the regional division, which was previously part of the Jayawijaya Regency.

The total area of Lanny Jaya Regency is 6,448 km² or equivalent to 2.03% of Papua province. In 2016, it was recorded that in Lanny Jaya Regency had 39 districts (sub-districts). Tiom is the capital of the regency. From a total of 39 districts, there are a total of 354 villages². According to data from the Central Statistics Agency Office of Lanny Jaya Regency, the temperature in the capital of the Tiom Regency is around 15.6 0C to 19.7 0C.

This is evidenced by the region's condition, which is cool, in the form of mountains. Lanny Jaya Regency is still in the interior of Papua. The trips from Wamena (Kabupaten Jayawijaya) to Tiom, some of the roads, have asphalt, but most of the tours are dirt roads and small pebbles. The Lanny Jaya Regency community consists of local people and some of the migrants. Based on Lanny Jaya Health Department recommendations, Tiom District was chosen as the target area for this ethnographic study. Various considerations were expressed by health service staff, among others: security and socio-cultural factors of the community that could represent the conditions of Lanny Jaya Regency. Tiom is an area that is considered quite neutral from the separatist movement in the district.

The availability of electricity and the internet network also makes it easy for researchers to do various kinds of records while in the research location. So the focus of this ethnographic research is in the Tiom District, which consists of 20 Villages and 1 Kelurahan. The choice of helminthiasis was the result of discussions of the Health Ethnographic Research (REK) team with the Lanny Jaya District Health Office.

In the 2015 health profile, cases of helminthiasis rank 5th in the top 10 diseases in Lanny Jaya Regency, including the Tiom District. Some community traditions that are considered to be one of the factors that cause helminthiasis in the district are clean and healthy living behavior, the existence of traditional houses/community "honai" and traditional stone-burning ceremony (barapen) [2, 6]. Worming is an infectious disease that is one of the health problems in the Tiom District.

The Health Service report said that in 2015 there were 2,787 cases of helminthiasis and put worm disease as the top 5 most suffered by the community. Looking at the behavior patterns of public health, the environment, and existing habits, helminthiasis that infects people in the Tiom District is caused by several species of worms. The worm examination has been carried out in school-age children, and the results show that about 80% of these schoolchildren are positively suffering from infections. After helminthiasis is examined, there are no interventions or steps to deal with the problem. Worms can reduce intelligence and inhibit the growth of children and even cause death [7, 8].

Worming is an infectious disease caused by the entry of parasites in the form of worms into the human body. Worms that often infect the human body consist of two major groups, namely Platyhelminthes and Nemahelminthes. Platyhelminthes consists of Cestoda and Trematoda, while Nemahelminthes is Nematoda. Humans are the definitive host of several intestinal nematodes (stomach worms) transmitted through soil (soil-transmitted helminths), including roundworms (*Ascaris Lumricoides*), hookworms (*Ancylostoma duodenale*, *Necator Americanus*) and whipworms (*Trichuris trichiura*). Factors that influence helminthiasis are environmental cleanliness, personal hygiene, clean water supply, cleanliness of the house's floor, use of the healthy toilet, and food hygiene [9-11].

Clean and Healthy Behavior (PHBS) is an approach to health behavior carried out because of personal and family awareness to be able to help themselves in the health sector. PHBS aims to make as many community members as agents of change as possible to improve the quality of behavior with the aim of clean and healthy living

according to health standards [12]. This ethnographic research activity looks for causes of health problems that are related to local customs and culture. This study will determine the risk factors in clean and healthy living behavior (PHBS) with helminthiasis that occur in the Tiom community. Worm disease problem analysis is carried out starting from Tiom Health Center and Lanny Jaya District Health Department.

Method

The study was an observational study that was retrospectively descriptive. Research material in the form of structured interviews and literature data review. Data collection is done through interviews and observations that are preceded by informed consent. Researchers listen, record, record audio, and video provided by the informant. Then the data is written in a logbook. Data is collected by a time-limited sampling method. Data collection process from May to June 2016 in Tiom District, Lanny Jaya Regency, Papua Indonesia.

Data analysis was performed based on the results of interviews and literature review. Furthermore, the data obtained from the data collection sheet is entered into the parent table and then processed and analyzed descriptively in the form of tables and narratives. This study was approved by the Health Research Ethics Commission of the Ministry of Health's Republic of Indonesia Research and Development Agency (Balitbang Kemenkes RI) and has been declared ethically feasible (No: LB.02.02 / 5.2 / KE.211 / 2016).

Results and Discussion

Community Characteristics

Based on the study results, it was found that the people of Lanny Jaya Regency consisted

of local people and migrants. These two communities can be divided into two, namely those who already have a variety of modern facilities and those still carrying out very traditional patterns of life. The majority of them still live in honai with very traditional equipment.

Community Residence

Indigenous people's homes in the form of honai, are traditional houses built from wood and a roof made of elephant grass (jenengga), and the floor is covered with dried grass. Honai is equipped with a door with a size of \pm 100 cm and no windows or cubicles. There are several honai with the kitchen joined into one. If cooking in a house with a stove, it is also used as a body warmer. When cooking using firewood, the smoke that rises cannot come out of the room. This is due to the absence of chimneys.

If smoke can leave the house, then the door will be opened so that air changes occur. The room inside the honai appears dark if there is no light illuminating. Sunlight cannot enter the honai because of the house's dense physical shape without a gap other than the door. Moreover, the honai also does not have air ventilation, only the front door, if open-air circulation occurs.

The honai floor that they used in the honai was in the form of window tiles or dried grass. Jenengga is said to be replaced regularly once or twice a month. However, sometimes people replace old ones with new ones when they are broken, and they start to feel uncomfortable.

In addition, people also put down bedding in the form of mattresses, pillows, bolsters, and thick blankets that look messy and dirty. Looks rarely washed or dried. Some clothes are also rumpled even though there is a cupboard or wooden box.



Figure 1: "Honai" residence
Source: researcher documentation

Some communities still live in honai with pig pets. Pigs are the most valuable treasure of the people, so they care for their pigs very much. The price of pigs can reach Rp20 to 50 million. The pig pen is cleaned if pig manure has accumulated. Some people release pigs from the cage every morning and put them into the cage in the late afternoon.

Hygiene and Community Sanitation

The Habit of Washing Hands with Soap and Running Water

Handwashing with soap and running water is a way to prevent the spread of disease. Washing hands should be done before and after eating, after defecation and small and in mothers who have babies [13, 14]. Tiom is a mountainous area where people use rainwater, river water, and pool water to dig for themselves called springs to meet water needs. Society is still challenging to get clean water, and this causes people to wash their hands rarely. The habit of the Tiom people shaking hands with the tuber each time they meet with relatives makes it possible to move the egg of the worm from one hand to the other.

Kumbi is a custom of the Tiom community, namely bending the index and middle fingers and then sticking them with other people's fingers in a similar position to then be pulled together until the sound comes out. In addition to the tuber, the Tiom community also has the habit of holding hands whenever they are alone with relatives or friends. This shows the existence of kinship and close friendship [15, 16]. Many community

activities that intersect with land, such as farming, certainly have an excellent opportunity to get worm disease. Infective worm eggs, if they are in dirty hands and then swallowed, will certainly cause helminthiasis. Some people, when they defecate, only use leaves or wood. If, after defecation does not wash hands with running water and soap, the worm eggs in the feces that stick to the hands will cause worm disease autoinfection for sufferers.

Do Not Wear Footwear

Most people earn a living as farmers. Every day both men and women work on the fields from morning to dusk. While working in the fields, they never wear footwear because it hinders the work done. According to some informants, if they work in the fields with footwear, they cannot move because footwear is involved in muddy ground. Muddy soil also causes worn footwear to break easily, so they prefer to go straight with the feet.

Not only the fields, but the roads in Tiom are also muddy, especially after it rains. Some people prefer to travel to a place on foot. The distance traveled can reach several days by going up and down hills and muddy roads, so if they wear footwear, it will complicate their journey. After returning from farming, some people do not wash their feet dirty from mud or soil. They are accustomed to entering the house with dirty feet from mud or soil. Not only farmers but also children of school age are rarely seen wearing shoes. When they play, there is no footwear attached to their feet [7, 17].



Figure 2: Children play without footwear
Source: researcher documentation

Various social changes in society are usually accompanied by multiple other changes, such

as changes in technology. Some people who already have better economic capacity and

better hygiene knowledge often use long rubber boots to help with their activities in the garden. This is inseparable from the community's learning process to use rubber boots to go to the Garden [18, 19].

Cutting Nail Behavior

The majority of society has long, black nails. Sometimes those who have short nails still look black under the nails [14, 20].



Figure 3: dirty nails
Source: researcher documentation

Some people have a habit of biting nails to shorten nails, sometimes using knives that can harm their fingers. However, those who have better knowledge about health and economic levels also have better nail clippers.

Open Defecation

The people of Tiom who live in Honai, usually have toilets made in the form of cubicles made of wooden frames. The cover is in the form of a banner or tarpaulin cloth leftover from certain activities or wood and plywood installed to cover in the toilet [21, 22].



Figure 4: left: latrine from inside; right: latrine toilet
Source: researcher documentation

The latrines they make are usually in the form of a box with a size of 1 meter by 1 meter, and a height of about 1.5 meters with a hole for disposal. Some people usually use leaves that grow around latrines or wood to clean up after defecation. People use toilets for defecating, but commonly women are only used to urinate. Men usually choose bushes or certain places as long as they are not near the honai. People usually wipe only with leaves or pieces of wood. After defecating, they also did not wash their hands.

This has the potential to cause helminthiasis autoinfection. Moreover, they often do not wash their hands before eating or doing other activities. Besides toilets, there are still people who defecate carelessly. Shrubs or under shady trees is a place that is often used. Littering feces will be eaten by pigs that roam around looking for food.

This will certainly cause pigs to be infected by worm eggs in the stool [23].

Bathing Habits

Access to clean water in the Tiom community is still limited and challenging. According to an informant's statement, let alone the community members, they don't bathe or rarely bathe every day, due to the cold environment. According to Amos H Hawley, the community usually continues to carry out the process of adaptation regarding matters faced by the environment in which they live.

The adaptation process is a community's ability to exercise control over the natural environment and "overcome" all the deficiencies offered by nature itself. This turned out to be true of people who needed to self-regulate the problem of water shortages in Tiom [17].

They explained that when bathing uses actual detergent as an ingredient for washing clothes. Only a small proportion of people use bath soap. Even many of those who bathe only use water and do not use soap. The location of bathing, mostly in the river or in a house with a well, some use rainwater reservoirs that use drums used asphalt roads or plastic water tanks. People claim that they usually take a bath only once a week or two weeks, or only take a shower if they feel hot or "hot" as told by one of the informants [17, 24, 25]. "We shower here rarely. Very cold. Take a normal shower when it's hot. At least two weeks, take a shower once if there is soap anyway. If not, then the water is ready.

We bathe normally in the river" (E.W., 36 years). The people we met had the notion that bathing was not good for them. Some of them feel that bathing can make their skin feel smooth and soft. The condition of the skin like that turned out to be considered as a condition of the skin that is less suitable for those who work in the garden. Working in the garden requires rough and hard skin, so it is not susceptible to various kinds of pain, especially those dealing with injured skin [26, 27].

The Habit of Drinking Water and Eating Raw Food

Water is a basic human need. In health science, each person needs an average of 2 liters of drinking water per day. By drinking clean and boiled water, it does not cause other diseases that are harmful to the body [21, 26].

The bottled drinking water in Tiom is very expensive, where a certain brand of 1 gallon of drinking water containing 9 liters can reach Rp.35, 000 - 50,000. While this price in big cities can be Rp. 15,000 - 18,000. Tiom people consume water from various sources such as rain-fed water, wells, ponds, and river water. Most people who drink are rarely cooked, but some cook drinking water, not all for health reasons. Some of them like to drink coffee, so they have to boil the water first. This is the reason why people boil water.

As for those who drink in the river, some are cooked, and some are not. Additional information about drinking water from a river obtained from the community is that they believe that water from the river in the morning is clean and can be drunk directly. But during the day, they usually do not want to drink water directly because it is considered water is dirty because there are people who wash upriver so that during the day they do not drink water from the river.

The habit of drinking from various sources without the cooking process often raises the potential for people experiencing helminthiasis. Raw water contaminated with worm eggs will infect if ingested by humans [17, 27, 28]. In addition to raw water, people like to eat raw foods such as sweet potatoes or raw vegetables. Coming home from harvesting sweet potatoes or vegetables, they usually wash the potatoes in the river. When washing sweet potatoes in the river, they eat sweet potatoes directly without cooking. The community also has a habit of putting grass or wounds into the mouth and chewing it.

Stone Burning Ceremony "Barapen"

One of the traditional customs of Tiom people in welcoming guests or opening a church, they perform a traditional ceremony that is the stone burning ceremony, commonly known as "barapen". At this ceremony, the community-made offerings of the most valuable treasure, the pig. The value of pigs for the people of Tiom is an expensive treasure. It can also be used as a symbol of wealth, meaning that people who have many pigs are said to be rich. The price of pigs can reach 10 to 50 million rupiahs.

Depending on how big or small, Pigs can also be used as other traditional ceremonies, such as for marriage or fines or fighting. The number of pigs burned was in the dozens or hundreds. Holes for burning pigs are made as needed, around 25 - 35 holes for burning pigs and about 70 to 100 pigs [17, 29].

The "barapen" stone burning ceremony is carried out by gathering the community and bringing pigs to the family for offerings. During the ceremony, hundreds of pigs were offered, and a "barapen" stone burning ceremony was held. The process of this ceremony was preceded by a speech from the traditional leader or priest, then some people brought wood, burned stones, speared pigs to be killed, and then split from head to

stomach; others made holes by filling vegetables.

After 3-4 hours the stone is burned, then the stone that is smoldering and hot is put into the prepared hole, followed by putting pork in the hole, then given another pile of vegetables, plus the stone that has been blazing, then covered with plastic sheeting and waited around 1-2 hours, after that the hole is opened. The pork which is burned with hot stones is eaten together by the community, not all aging pigs are cooked evenly, sometimes it still looks raw, and the community also consumes this. This is worrying because undercooked pork will cause worm transmission from pigs to humans.



Figure 5: left: scene of the "barapen" stone-burning ceremony; right: eat pork
Source: researcher documentation

Conclusion

Risk factors in the habits of the Tiom community in Lanny Jaya Regency, Papua Indonesia, have the potential to cause helminthiasis because hygiene and environmental sanitation are less clean. Personal hygiene and sanitation which includes; the habit of washing hands with running water and soap that is still low, not wearing footwear, the pattern of cutting nails that are still low, the practice of open defecation, the habit of bathing which is very rarely done, drinking water and eating raw food, and eating pork at a time "Barapen" stone burning ceremony.

References

1. Foster GM, Anderson BG, Suryadarma PP, Swasono MF (2006) Antropologi kesehatan. Penerbit Universitas Indonesia.
2. Papua DKP (2017) Profil kesehatan Provinsi Papua tahun 2016. Jayapura, Papua Dinas

Suggestion

For reducing the prevalence of helminthiasis in the Tiom community, counseling is completely needed about personal hygiene in bathing, cutting nails, wearing footwear, defecating in a closed place, eating, and drinking that has been cooked. In addition, it is necessary to practice clean and healthy behavior in the church when the community performs worship on Sundays. At the barapen stone burning ceremony one can use additional heaters to burn the pig so that it is fully cooked and safe to eat.

Kesehat Provinsi Papua.

3. Dasar RK (2013) RISKESDAS 2013. Jakarta Kementerian Kesehat RI.
4. Balitbangkes Kementerian Kesehatan RI (2013) Penyajian Pokok-Pokok Hasil Riset

- Kesehatan Dasar, 2013: 265.
5. Balitbangkes Kementerian Kesehatan RI (2013) Penyajian Pokok-Pokok Hasil Riset Kesehatan Dasar 2013.
 6. Ananta A, Utami DRWW, Handayani NB (2016) Statistics on ethnic diversity in the land of Papua, Indonesia. *Asia Pacific Policy Stud.*, 3(3):458-74.
 7. Flassy M (2018) Local Knowledge, Disease and Healing in a Papua Community. Georg-August-Universität Göttingen.
 8. Sutanto I, Ismid IS, Sjarifudin KP S (2008) Buku Ajar Parasitologi Kedokteran Edisi Keempat. Jakarta Balai Penerbit FK UI.
 9. Brooker S, Clements ACA, Bundy DAP (2006) Global epidemiology, ecology and control of soil-transmitted helminth infections. *Adv. Parasitol.*, 62: 221-61.
 10. Kesehatan D (2006) Keputusan Menteri Kesehatan No 424/menkes/sk. VI/2006 tentang Pedoman Pengendali cacingan.
 11. Cooper PJ (2004) Intestinal worms and human allergy. *Parasite Immunol.*, 26(11- 12):455-67.
 12. Kementerian Kesehatan RI (2011) Pedoman pembinaan perilaku hidup bersih dan sehat (PHBS). Jakarta Kementerian Kesehatan RI.
 13. Fenwick A (2012) The global burden of neglected tropical diseases. *Public Health.*, 126(3):233-6.
 14. Fitzpatrick KR, Pantle AC, McLaws M, Hughes CF (2009) Culture change for hand hygiene: Clean hands save lives, Part II. *Med. J. Aust.*, 191(S8):S13-7.
 15. Magen E, Borkow G, Bentwich Z, Mishal J, Scharf S (2005) Can worms defend our hearts? Chronic helminthic infections may attenuate the development of cardiovascular diseases. *Med Hypotheses*, 64(5):904-9.
 16. Sheth M, O'brah M (2004) Diarrhea prevention through food safety education. *Indian J. Pediatr.*, 71(10):879-82.
 17. Putro, G; Asnawyah, R; Timoti T (2017) Buku Seri Riset Etnografi Kesehatan: Barapen Dan Cacing Pita Di Tana Papua. 3rd ed. Puslitbang Humaniora Kesehatan DM, Kesehatan BL, editors. 2016: PT Kanisius Yogyakarta.
 18. Arnston P (1989) Improving citizens' health competencies. *Health Commun.*, 1(1):29-34.
 19. Phiri K, Whitty CJM, Graham SM, Ssembatya-Lule G (2000) Urban/rural differences in prevalence and risk factors for intestinal helminth infection in southern Malawi. *Ann Trop. Med. Parasitol.*, 94(4):381-7.
 20. Zaias N (2012) The nail in health and disease. Springer Science & Business Media.
 21. Cairncross S, Hunt C, Boisson S, Bostoen K, Curtis V, Fung ICH, et al (2010) Water, sanitation and hygiene for the prevention of diarrhoea. *Int. J. Epidemiol.*, 39(1): i193-205.
 22. Prüss A, Kay D, Fewtrell L, Bartram J (2002) Estimating the burden of disease from water, sanitation, and hygiene at a global level. *Environ. Health Perspect.*, 110(5):537-42.
 23. Hotez PJ, Bundy DAP, Beegle K, Brooker S, Drake L, de Silva N, et al (2006) Helminth infections: soil-transmitted helminth infections and schistosomiasis. In Oxford University Press and World Bank.
 24. Pengpid S, Peltzer K (2012) Hygiene behaviour and health attitudes in African countries. *Curr Opin Psychiatry*, 25(2):149-54.
 25. Nakajima T, Lehdonvirta V, Tokunaga E, Kimura H (2008) Reflecting human behavior to motivate desirable lifestyle. In: Proceedings of the 7th ACM conference on Designing interactive systems. ACM, 405-14.
 26. Figueroa ME, Kincaid DL (2010) Social, cultural and behavioral correlates of household water treatment and storage. *Cent Publ HCI 2010-1 Heal Commun Insights*.
 27. Dreibelbis R, Freeman MC, Greene LE, Saboori S, Rheingans R (2014) The impact of school water, sanitation, and hygiene interventions on the health of younger siblings of pupils: a cluster-randomized trial in Kenya. *Am J. Public Health.*, 104(1):e91-7.
 28. Asnel R, Sari LA (2019) Correlation Family's Healthy Lifting Behavior with Diarrhea in Toddlers. *KnE Life Sci.*, 4(10):197-205.
 29. Van Den Broek T (2005) Social Aspects in Papua. *Econ Soc Cult Rights West Papua A Study Soc. Real Polit Perspect.*, 133-214.