

## Kapsam Belirleme İncelemesi: Malezya'daki Aborjinler Arasındaki Parazit Kontrol Uygulamaları Hakkında Sağlık Okuryazarlığı Açıklıkları

### Scoping Review: Health Literacy Gaps about Parasites Control Practices among Aborigines in Malaysia

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#### ÖZ

Malezya'da aborjinler arasında en sık görülen hastalık parazit enfeksiyonudur. Bu olay, aborjinler arasında düşük sağlık okuryazarlığı ile ilişkilidir. Bununla birlikte, Malezya'daki aborjinler arasında sağlık okuryazarlığı açıklıkları ile ilgili az sayıda çalışma bulunmaktadır. Bu çalışmada, Arksey ve O'Malley beş aşamalı çerçeve kullanılarak bir kapsam incelemesi kullanılmıştır. 2010'dan 2019'a kadar ilgili çalışmaları bulmak için üç çevrimiçi veritabanı SCOPUS, SCIENCE DIRECT VE PUBMED kullanıldı. Arama stratejisi taranan 481 çalışma belirlendi ve yalnızca 13 uygun tam metin çalışma seçildi. Mevcut inceleme, Malezya'daki aborjinler arasındaki sağlık okuryazarlığı açıklıklarına kapsamlı bir genel bakış sunmaktadır. Aborjinler arasındaki dört sağlık okuryazarlığı açıklığı, listelenen 13 çalışmadan tespit edilmiştir: hijyen, tesis, eğitim ve uygulama. İnceleme, kontrol önleminin yeniden değerlendirilmesini ve uygun eğitim yoluyla sağlığın teşviği, iyileştirilmiş tesisler, yoksulluğu azaltma programları ve kitlesel ölçekte kurtları yok etme uygulaması gibi uzun vadeli müdahaleler önermektedir. **Anahtar Kelimeler:** Aborjinler, sağlık okuryazarlığı, sağlık eğitimi

#### ABSTRACT

Parasitic infection is the most common disease among aborigine in Malaysia. This incident is associated with low health literacy among aborigine. However, there are few studies that are related to health literacy gaps among aborigine in Malaysia. A scoping review was used in this study by using five stage framework Arksey and O'Malley. Three online database SCOPUS, SCIENCE DIRECT AND PUBMED were used to find relevant studies from 2010 until 2019. The search strategy identified 481 screened studies and only 13 eligible full text studies were chosen. The current review provides an extensive overview of health literacy gaps among aborigine in Malaysia. The four health literacy gaps among aborigine have been identified from 13 listed studies: hygiene, facility, education and practice. The review recommends reassessment of control measure and long term intervention such as health promotion through proper education, improved facilities, poverty reduction programs, and implementing mass-scale deworming.

**Keywords:** Aborigine, health education, health literacy

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#### INTRODUCTION

Health literacy is the primary determinant of a person's health and well-being.<sup>1</sup> It is a component of various literacies listed in health and education, such as cultural literacy, technology literacy, media literacy, and scientific literacy. Health literacy has three levels, which are basic or practical (skills of reading and writing in daily life), communicative or interactional (skills of psychological, cognitive and learning), and vital (skills of information use and circumstances handling) according to past research studies.<sup>2</sup> Health literacy studies will produce new recommendations and new information for health care

providers to share with their client.

Few studies provide evidences that parasitic infections are health recurrent issue among aborigine.<sup>3</sup> According to reports, the total prevalence of STH (Soil Transmitted Helminths) in Malaysia is 72.7 %, with the dominant infection being *T. trichiura* being 58.4 %, followed by *A.lumbricoides* being 45.5 % and the least infection being 23.1 % hookworm.<sup>4</sup> Strategies of control of parasitic infection may vary based on locality or suitability either chemical approaches such as drugs,<sup>5</sup> non-chemical approaches such as hygiene practices,<sup>6</sup> or biological – bio control.<sup>7</sup>

The success of the parasitic control depends on the management of parasitic control programs and cooperation given by aborigine.<sup>8</sup>

Aborigine or indigenous peoples are individuals with special cultures, systems of understanding and beliefs. Indigenous peoples also have much in common with other marginalized segments of society, such as lack of political representation and participation, economic marginalization and deprivation, lack of access to social services and discrimination.<sup>9</sup> Several studies have shown that chronic disease prevalence among indigenous peoples throughout the world is disturbingly high.<sup>10</sup> The aborigine in Peninsular Malaysia has a lower health ranking than the general population in terms of wellbeing.<sup>9</sup>

Poor hygiene is one of the factors contributing to the parasite or bacterial infection. It is vital to avoid environmental-personal hygiene from infection. Infections with parasites can be prevented by improving supply systems, sanitation, hygiene, especially among aborigine.<sup>11</sup> Infections with parasites can be infected by a variety of sources. One of the primary sources of infection is faecal-oral transmission.<sup>12</sup> There are two forms of direct and indirect transmission. Direct transmission is the transmission of faecal-oral or from human to human or animal to human. Transmission through contaminated food causes infection indirectly. Poor hygiene, lack of clean water sources, and no hand washing, bathing, or hair washing exacerbate the situation. This problem can lead to parasitic infections such as head lice infections.

Another issue that will lead to parasite infection is a lack of knowledge among aborigines. Some aborigines are unaware of the infection that is afflicting them. The most parasitic infection affecting aborigines is soil-borne helminth (STH) infections consisting of *Ascaris lumbricoides*, *Trichuris trichiura* and hookworm infections.<sup>13</sup> Poor aborigine health education and awareness make them neglect their polluted world and their safety.

Based on the author knowledge, there are fewer studies related to health literacy among aborigine conducted in Malaysia.

The scoping review aims to identify the health literacy gaps in developing guidelines related to health literacy towards parasites control among aborigines throughout the published article. Besides that, the objective is also to recognize recommendation practices in order to control parasitic infection.

## MATERIALS AND METHODS

The paper was Editor invited review. Ethics committee approval is not required.

The scoping review has been used in this study to identify health literacy gaps among aborigine from 2010 until 2019 publishing papers.

According to Craig et al.<sup>14</sup> stated that there are seven benefits through scoping review which are (i) provide indicator of topics for subsequent systemic review; (ii) to examine a broad area of knowledge, and identify the gaps in the research knowledge/base; (iii) to clarify and map key concept/definition underpinning a research area; (iv) to clarify working definition and/or the conceptual boundaries of topics; (v) to report on the types of evidence that are published in a certain field; (vi) to examine emerging evidence when it still unclear what other, more specific questions can be posed and valuably addressed; (vii) to examine the conduct of research on a certain topic (to inform the design of future research studies).

The methodological framework by Arksey and O'Malley has been use as guidance for this study. The components of the framework are (i) identify research question, (ii) identify relevant studies, (iii) studies selection, (iv) charting the data (v) collating, summarizing and reporting the results.<sup>15</sup>

### **Identifying Research Question to be Addressed:**

The study's research questions were;

- i. What are the health literacy gaps about parasite control practices among aborigine?
- ii. What are the recommended practices towards parasitic control among aborigine?

### **Identifying Relevant Studies Related to Research Question:**

This study search strategy used electronic database searching of published paper from 2010 until 2019 in SCOPUS, SCIENCE DIRECT AND PUBMED related to health literacy among aborigine keywords. All search starts in January 2020 until March 2020. The studies selections are completed over 3 months.

**Search Strategy:** Health literacy\* OR Health education\* AND Aborigine OR Aborigine\* AND Malaysia.

**Studies Selection to Include in the Review:** The process of study selection was followed Preferred Reporting of Items for Systematic Reviews and Meta-analyses (PRISMA). Studies found using keywords will be screened by title. Any inclusion or exclusion criteria that do not meet will be rejected. The abstract was read in order to categorize the studies as relevant, not relevant, or potentially relevant.

Established keywords were used based on previous research and expert review. Two duplicated articles were removed at this stage after careful screening.

We will contact the article's correspondence via e-mail if there is any confusion or require more clarification to ensure that the article is correctly chosen for review.

**Inclusion Criteria:** The type of article that is included in this study is assessed based on study period from 2010 until 2019. Only articles from SCOPUS, SCIENCE DIRECT AND PUBMED to be used. Keywords that used are based on research titles

which were health literacy, health education, and aborigine. The type of research of the article must be in quantitative, qualitative or mixed-method study only. The article chosen must be in the English language only. The location study was in Malaysia.

**Exclusion criteria:** Unrelated to abstract, health literacy, and non-aborigine and not in Malaysia region.

**Charting the Data of Including Studies:** All the data of the relevant studies are extracted by authors, including the year of publication, location, study design or sample size, and outcomes with brief limitation.

**Collating, Summarizing and Reporting the Results:** As the study is scoping review, narrative analyses undertake to summarize the report findings.

**Data Abstraction and Analysis:** The 13 studies were reviewed by two trained reviewers independently. Papers were only considered for review if all of the reviewers agreed on them. If there was a disagreement, the paper was evaluated by a third reviewer.<sup>16</sup> The findings will be compared, and any discrepan-

cies will be forwarded and discussed with the third reviewer before finalization.

**RESULTS**

In the discovery process all papers were found using three online database searches: SCOPUS, PUBMED AND SCIENCE DIRECT. A total of 481 papers were found. However, after through screening, 14 articles were selected for this study review. (Figure 1: Process of Literature Search). The study list was tabulated in Table 1. All articles are considered good quality after a thorough assessment.

Throughout thorough discussion among the team, four health literacy gaps among aborigines have been identified from 14 listed articles: hygiene, facility, education and practice.

In the study list, health gaps on education obtained in thirteen studies, health gaps in facilities obtained in seven studies, health gaps in hygiene obtained in twelve studies and health gaps in practice obtained in ten studies.

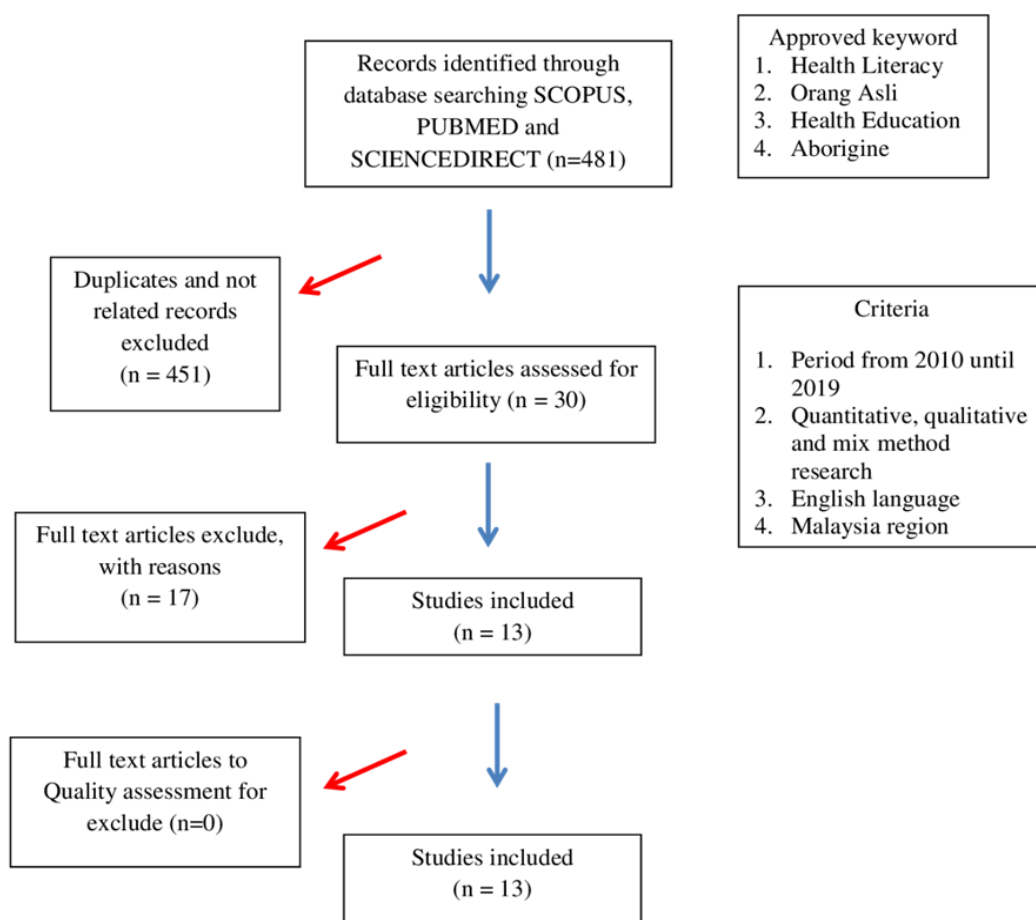


Figure 1. Process of literature search.

**Table 1.** List of the research literature.

No	Author	Title	Location	Sample/ Type of Re- search	Findings	Health issue	Contribution Factor - Gap	Outcomes & Recommendation
2	Al-Mekhlafi HM et al. 2014 (13)	Does vitamin A supplementation protect schoolchildren from acquiring soil-transmitted helminthiasis? A randomized controlled trial	Malaysia	n = 250 RCT Experimental study	98.6% children infected at least one STH species. Prevalence ascariasis, trichuriasis and hook worm infection was 67.8%, 95.5% and 13.4%.	Reinfection of parasites. Vitamin A supplementation showed no protective effect against STH reinfection due to high endemicity.	Education Hygiene	Vitamin A deficiency (VAD) and iron deficiency anaemia (IDA) that can have community-level effects on adult work and productivity, and on children's development, learning and school performance. Long term interventions to reduce poverty will help significantly in reducing this STH infection.
3	Huat LB et al. 2012 (17)	Prevalence and risk factors of intestinal helminth infection among rural Malay Children	Malaysia	n = 79 . Cross sectional study	Multivariate analysis on predictors helminths infection were Poor education of mother (p=0.015), eating raw salad (p=0.03) .	Less trained mothers were possibly also unaware of proper hygienic practises and health-seeking behaviours.	Education Hygiene Practice	Focus on the efficacy of education mother in preventing intestinal helminth infections among their children shall establish.
4	Ngui R et al. 2015 (19)	Patterns and Risk Factors of Soil-Transmitted Helminthiasis among Orang Asli Subgroups in Peninsular Malaysia	Malaysia	n = 634 cross sectional study	Multivariate analysis confirmed that low family income(p=0.005) Househoid with no toilet facility (p=0.018) , walking barefoot (p=0.018) and close contact with animal (p=0.002) more likely to have STH infection.	Poor environmental sanitation, personal and sanitary behaviour including defecation practices, lack of footwear, not washing hands before eating significant risk factors for various infection diseases including parasitic infection.	Education Hygiene Facilities Practice	Integrated effective control program such as poverty reduction program, implementing mass scale deworming and health promotion campaign need to be established to control the infections.

Table 1. List of the research literature (Continue).

5	Tang & Kamei 2019 (21)	Soil-Transmitted Helminthiasis among Orang Asli (Aborigine) Schoolchildren at RPS Banun, Gerik, Perak, Malaysia.	Malaysia	n = 116 cross sectional study	81.9% of school children were found to be infected with at least one STH species	Observed that aborigine's children tended to not wash hands before and after eating and eat raw foods without washing and defecate at the site of river. Poor water supply and sanitation observed.	Education Hygiene Facility Practice	Integrated approaches towards STH control such as environmental sanitation, health education about personal and food hygiene and enhancement of nutritional status shall be implemented.
6	Al-Delaimy et al. 2014 (23)	Epidemiology of Intestinal Polyparasitism among Orang Asli School Children in Rural Malaysia	Malaysia	n = 498 cross sectional study	Multivariate analysis - Unsafe water (p=0.003), absence of toilet in house (p=0.014), presence of infected family member (p=0.026), not cutting nails periodically (p=0.010) and not washing vegetables before eating (p=0.001) significant risk factor for polyparasitism.	Using unsafe water supply, presence of other family members infected with intestinal parasitic infection, not washing vegetable before consumption, absence of a toilet in the house, not wearing shoes when outside, not cutting nails periodically, and not washing hands before eating	Education Hygiene Facility Practice	Effective and sustainable control measures, proper health education on hygiene practices, proper sanitation, and safe drinking water supply to be implemented to reduce STH infection.
7	Ahmed A et al. 2011 (24)	The burden of moderate-to-heavy solid transmitted helminth infections among rural Malaysian aborigines: an urgent need for an integrated control programme	Malaysia	n = 254 cross sectional study	Univariate analysis revealed using untreated water supply (p=0.013), absence in house toilet (p=0.027) and having domestic animals (p=0.044) had significantly risk factor moderate to heavy STH infections. Logistic regression confirmed using untreated water for drinking (p=0.001) and absence in house toilet (p=0.003) significant risk factor moderate to heavy infection.	Poor personal hygiene including no hand washing before and after eating with poor facilities caused no end issue.	Education Hygiene Facility Practice	Serious attention required to overcome the issues. More poverty alleviation schemes, proper sanitation, provision of clean and safe drinking water, health education and deworming school based programmes to be conducted.
8	Wong WK et al. 2016 (25)	Helminthic Infection and Nutritional Studies among Orang Asli Children in Sekolah Kebangsaan Pos Legap, Perak	Malaysia	n = 33 , mixed method	Anthropometry analysis showed 78% children were malnourished and 33% were stunted.	Consistent with high STH infection and low nutritional status	Education Hygiene Facility Practice	To improve socioeconomic status, educational standard and health facilities. Effective medication to be administered and nutritional programs to be embarked.

Table 1. List of the research literature (Continue).

9	Rajoo Y et al. 2017 (26)	Neglected Intestinal Parasites, Malnutrition and Associated Key Factors: A Population Based Cross-Sectional Study among Indigenous Communities in Sarawak, Malaysia	Malaysia	n = 341 cross sectional study	Multivariate analysis indicated absence of toilets (p=0.002), close contact with animals (p=0.027) significant predictors for Intestinal Parasitic Infections. Low parental education attainment (p=0.006) significant indicator for anaemia. Meanwhile, low house income predictor for stunting (p=0.0001) and underweight (p=0.037)	Study highlighted that intestinal parasitic infections, anaemia and malnutrition still prevalent among rural indigenous community.	Education Hygiene Practice	Improving socioeconomic status , periodic mass deworming, iron supplementation and health education to include public health intervention programs.
10	Nantha & Mohamed (2019) (27)	Soil-Transmitted Helminthiasis amongst the Orang Asli School Children at Sungai Raba Village Gerik, Perak, Malaysia.	Malaysia	n = 139 cross sectional study	Prevalence STH was 74.1%.Highest infection rate between children aged between 10 - 11 years (83%/0).	Low health standard - careless on personal hygiene	Education Hygiene Practice	Improving socioeconomic status including enhanced access to quality health care and adequate sanitation potential significant reduced the STH infection.
11	Nasr NA et al.2013 (28)	Towards an effective control programme of soil-transmitted helminth infections among Orang Asli in rural Malaysia. Part I: Prevalence and associated key factors	Malaysia	n = 215 cross sectional study	78.1% of children were found to be infected with one or more STH species	Using unsafe water supply, absence of proper sanitation, hygiene practices associated with STH infections.	Education Hygiene Facility Practice	Urgent de-worming programmes and providing proper sanitation, clean water supply, proper health education regarding personal hygiene practice should be established.
12	Chin YT et al. 2016 (29)	Prevalence and risk factors of intestinal parasitism among two indigenous sub-ethnic groups in Peninsular Malaysia	Malaysia	n = 186 cross sectional studies	Multivariate analysis risk factors Untreated water source (p:0.007); Not wearing shoes outside at home (p:0.014);Not washing hands after defecation (p:0.009);family size (p:0.012);not boiling water before consumption (p:0.023) „unemployed (p:0.020)	Variations in living habits such as personal hygiene practices may predispose different groups to different parasitic infection.	Education Hygiene Facilities Practice	Imperative to implement sound intervention strategies such as periodic preventive chemotherapy with health education in order to eradicate STH infection.
13	Al-Delaimy AK et al. 2014 (30)	Developing and evaluating health education learning package (HELP) to control soil-transmitted helminth infections among Orang Asli children in Malaysia	Malaysia	n = 317 controlled intervention	Health education learning package (HELP) provides significant impact compared those in control school (p<0.05).	To access impact HELP to improve knowledge of aborigine's Community	Education	HELP Health education learning package displayed significant impact and improved knowledge about parasitic infection. Incidence rates of hookworm infection significant lower compared to control.

## DISCUSSION AND CONCLUSION

According to the World Health Organization,<sup>1</sup> health education is any mix of learning opportunities intended to help individuals and societies enhance their health by improving awareness or changing attitudes. Health education is a significant component of health promotion activities. Health literacy is the product of good health education, improving the capacity of individuals to access and use health knowledge to make informed health choices and preserve essential health. Education is critical for these studies because it raises aborigine awareness about anti-parasitic packages. Based on previous research, too little is known about the effect of vitamin A supplements on STH infections.<sup>13</sup> Vitamin A deficiency and iron deficiency anemia can have a community-wide impact on adult work and productivity, as well as children's development, learning, and academic performance. Less educated mothers were more likely to be unaware of good hygienic practices and health-seeking behaviours.<sup>17</sup> This demonstrates that if the level of mothers on hygiene knowledge is low, the entire family suffers. This is because parents will set a good example for their children. Proper education will provide aborigine with the necessary information about parasite infection. Families will learn by share basic knowledge and practice good hygiene internally. Simultaneously, the proportion of aborigine infected with parasites would decrease.

Seven studies shared the same idea that lacking proper facilities contributes to the health issues among aborigine in Malaysia.<sup>4,19,21,23,25,28-29</sup> Facilities are places, amenities, or pieces of equipment that are available for a specific purpose. The Department of Orang Asli Development (Malay : *Jabatan Kemajuan Orang Asli*) abbreviated JAKOA in Malaysia has already provided many facilities for the aborigine population, such as project toilets and clean water. However, according to previous research, some Aborigine villages continue to be underserved in terms of facilities.<sup>18</sup> Ngui et al.<sup>19</sup> stated that the household-based toilet facilities among these groups were almost non-existent. Due to poor maintenance, some aborigines did not use this facility. They have clear sources of subterranean water-flow pollution.<sup>19</sup> Review showed that poor environmental sanitation and poor clean water supply are associated with recurrent STH infection.

Practice refers to the ways in which they demonstrate their knowledge and attitude through action.<sup>20</sup> Ten studies noted on health gaps about proper practice that contributes to the recurrent infection of STH among aborigine.<sup>17,19,21,23-29</sup> Children of aborigine tended not to wash their hands before and after feeding. They ate raw foods such as fruit without washing.<sup>21</sup> Walking outside without slippers or

shoes is another bad habit that needs to be broken. The shoes are crucial to protect parasitic infection. It is necessary to change the habitual practice accordingly. In order to prevent parasitic infections, health care providers must constantly advise parents to monitor children regularly.

Hygiene is a series of health-care practices performed. Hygiene refers to conditions and activities that help preserve health and prevent the spread of diseases.<sup>22</sup> Personal hygiene refers to keeping the body clean. Many people are equal to hygienic 'cleanliness,' but hygiene is a broad term. This involves options such as how much to take a bath or shower, wash hands, cut fingernails and wash clothing. This also requires a commitment to maintaining surfaces at home and work, including facilities for safe and pathogen-free baths. It is frequently stated that aborigine's children have poor personal hygiene.<sup>23</sup> As we all know, introducing something foreign into the body can endanger our safety. Parasitic infections are common in children because some of them do not wash their hands after playing with sand, and some even eat sand as a result of their play activities. They are now vulnerable to parasites as a result of their already weakened systemic immune system. The review showed that aborigines have a low standard of proper hygiene. Perhaps due to habitual life style caused hygiene concern is not their priority.

Based on the findings, the four elements shall not be ignored in developing protocol or guidelines in anti-parasitic infection among aborigines. The four elements must be integrated and work in synergy to ensure that the program's outcomes are as efficient as possible. The review recommends reassessment of control measure<sup>4</sup> and long term intervention<sup>13</sup> to control parasitic infection. The poverty reduction program to improve socioeconomic status among aborigine was a part of long term intervention to overcome the STH infection.<sup>4,13,19,24-27</sup> Besides that, improving proper facilities such as improving sanitation areas and providing clean and safe water also contributes to the proper strategies of managing parasitic infection.<sup>21,23,26-28</sup>

The establishment of a health promotion campaign and the implementation of mass-scale deworming will accelerate the parasitic control programme.<sup>4,19,25,27-29</sup> The relevant thirteen studies also recommend proper health education to aborigines.<sup>4,13,17,19,21,23-30</sup> Huat<sup>17</sup> encourages educating aborigine mother to prevent parasitic infection towards the children. The review supports health education on hygiene and daily practices to ensure continuity of proper and healthy lifestyle.

This scoping review has numerous strengths from this research. The intensity of this research can be established by the using several databases using

SCOPUS, PUBMED and SCIENCEDIRECT to find studies related to health literacy related to the aborigine. Some researches, including study emphasis outside of Malaysia and not focused on aborigine were omitted. All forms of studies such as quantitative, qualitative and mixed-method were included to skip small related studies.

In conclusion, identifying the contributing critical health gap element in the development of new health literacy guidelines is crucial to slow the increase in the percentage of parasitic infections among aborigines. Education, facilities, practice, and hygiene are just a few critical elements that must be prioritized.

There is a limitation of this review which is that sources are restricted. There is only a range of research papers that are relevant and applicable to this report.

Future research should use these elements to develop basic guidelines for aborigines that are approachable and self-explanatory. This will raise their awareness of parasite infection by providing proper guidance and aborigine health education. Furthermore, higher authorities must ensure that these aborigines live a healthy lifestyle and avoid activities that may result in parasite infection.

**Ethics Committee Approval:** Editor invited review. Ethics committee approval is not required.

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