

Awareness of and knowledge about the Prevalence of Schistosomiasis in 15 endemic Villages of Lala, Lanao del Norte

Ferlyn Villaroya Logronio*, Cesar G. Demayo

Department of Biological Sciences, College of Science and Mathematics, MSU-Iligan Institute of Technology, Iligan City, Philippines

Abstract: Knowledge, attitudes and preventive practices of the people at risk for schistosomiasis are important aspects for the control and prevention of the disease. This study evaluated the awareness of and knowledge about the occurrence of schistosomiasis in the Municipality of Lala, Lanao del Norte. Most of the respondents were aware (87.08%) and can properly articulate the signs and symptoms (60.84%) brought about by the disease. Water contact (64-15%) had been identified as the main mode of transmission of the disease in which farmers were the most at risk. However, farming had not been limited since the main livelihood in the area is dependent on it. This presuppose that provision of various snail control programs, enrichment of the zero-open defecation program and proper waste disposal should be implemented on top of the mass drug administration to totally control and prevent the re-occurrence of the disease in the area.

Key words: Schistosomiasis; Prevalence; Endemicity; Mass drug administration

1. Introduction

Schistosomiasis is one of the most widespread parasitic infections afflicting mankind for a long time and one of the neglected tropical disease found in tropical and subtropical areas of Africa, Asia and Latin America (WHO, 2010). It is the second most prevalent and socio-economically devastating disease after malaria (Carter Center, 2014). Worldwide, an estimated 207 million people in 76 countries and territories (Bruun and Aagaard-Hansen, 2008) are infected, with 120 million showing symptoms and 20 million have severe debilitating disease (WHO, 1998). In the Philippines, according to the Department of Health, locally, the disease is endemic in 28 out of 81 provinces distributed in 12 regions with a total population of 12 million exposed to the disease.

Most of the areas, where schistosomiasis is prevalent, show a picture of poverty and low-income population without access to safe drinking water and adequate sanitation. Schistosomiasis also thrives where environmental sanitation is poor, making freshwater sources the usual disposal sites of human feces causing contamination of the environment with schistosome eggs. Farmers and irrigation workers whose occupation exposes them to contaminated water are considered as high-risk group. Women who collect water, wash clothes, dishes and cooking utensils are most likely to become infected. Children who play and swim in the lakes, dams and irrigational canals increase their exposure risk when

they stay in the water for a long time with their entire bodies submerged.

In the endemic areas of the Philippines, there is a common scenario of low quality housing and lack of basic infrastructure especially sanitation drainage and clean water supply, that resulted in poor social and environmental conditions which have significant impact on the spread of infectious diseases, including promotion of transmission of schistosomiasis.

Accordingly, schistosomiasis can be controlled using various approaches that includes: removing cattle from the grassland where the snail resides (Wang et al., 2009), improved sanitation, health education, mass treatment with praziquantel (Odhiambo, 2014), safe water supply and snail control (Gazzinelli et al., 1998). In the Municipality of Lala, Province of Lanao del Norte, Philippines, like any other endemic areas in the island, the government is conducting mass drug administration to all residents from the endemic areas regardless if the person is infected or not. Public schools are also covered with the treatment. Moreover, promotions of proper personal hygiene, access to safe water, and sanitation improvement as well as environmental management are additional interventions done to further prevent the spread of the infection. However, the success of control initiatives involving the community depend on the level of the communities' acceptance and participation to the program, which depend entirely on understanding the community knowledge and practices towards the disease and

* Corresponding Author.

recommended preventive and/or treatment regimen.

Knowledge, attitudes and preventive practices of risk groups for schistosomiasis are important aspects for their control (Mazigo et al., 2010). To further evaluate these strategies there is a need to research on the people’s knowledge, attitudes and practices towards schistosomiasis control (MOPHS, 2011). Thus, this study was conducted. Aiming to assess community knowledge, attitudes and practices on schistosomiasis (its existence, signs and symptoms, causes, transmission, control and risk factor), the finding of which will provide information and would bridge possible gaps to enhance a successful control programs in the area and would also help one to test how readily or prepared the community would assimilate and embrace the unique control measures to be instituted later (Ukwandu et al., 2004).

2. Material and methods

2.1. Study site, population and healthcare deliver

The study was conducted in the endemic villages of the Municipality of Lala, in the Province of Lanao del Norte, Region 10, North Central Mindanao, Philippines (Fig. 1) with the geographical coordinates of 07°58’N 123°45’E. A vast plain within the Kapatagan Valley, consisting of 14,025 hectares (34,660 acres) along the coast of Panguil Bay, with a total population of 65,355 according to the 2010 population census. The main economic activities of the area are based mostly on agriculture and fishery-based type.

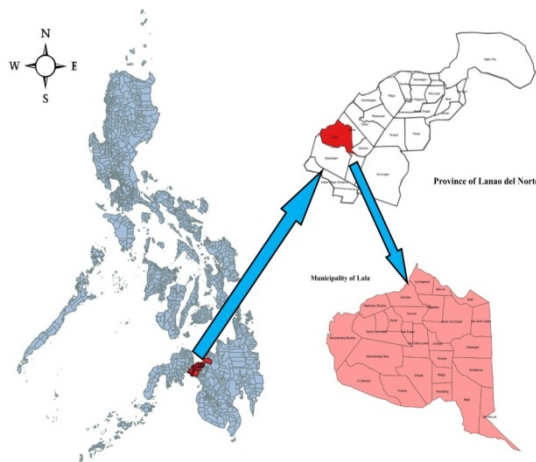


Fig. 1: The study site.

First inset is the Map of the Philippines showing the Province of Lanao del Norte, second inset is the map of the Province of Lanao showing the Municipality of Lala and third inset is the Map of the Municipality of Lala with village boundaries.

Schistosomiasis is endemic in 15 Villages within the municipality risking a total population of 43,145 with a prevalence rate of 0.04% in the year 2014.

Presence of infected intermediate snails has also been reported, suggesting active transmission (Legaspino et al., 2014).

Poor sanitation was evident with the presence of the 6.05% household without proper toilet facility (NSO, 2010), improper backyard cattle raising and no proper garbage disposal practices. Moreover, domestic water sources are mostly from shared tubed or piped deep well. On the other hand, the Municipality is endowed with functional and well-equipped health center run by a Municipal Health Officer and staff as well as respective Village Health Centers on all endemic and non-endemic villages within the municipality manned by highly trained midwives and village health workers.

2.2. Study design

The study was a cross-sectional analysis participated by 486 households out of the 515 targeted households which were randomly selected from the 15 endemic villages. (Table 1 summarized the socio-demographic profile of the respondents). The heads of the households or the eldest in their absence were considered for the interview. Students from the colleges in Brgy, Maranding and workers from different establishments were also represented.

Table 1: Socio-demographic profile of the respondents

Variable	Female	Male
Number of Participants	304	185
Age (mean range)	41.47	43.74
Marital Status (%)		
Married	234 (76.97)	141 (77.47)
Widowed	24 (7.89)	9 (4.95)
Separated	2 (0.66)	1 (0.55)
Single	44 (14.47)	31 (17.03)
Education (%)		
None educated	24 (7.84)	20 (11.17)
Primary	65 (21.24)	40 (22.35)
Secondary	136 (44.44)	76 (42.46)
College Education	81 (26.47)	43 (24.02)
Occupation (%)		
Businessman	52 (17)	5 (2.79)
Farmer	36 (11.76)	83 (46.37)
Housewife/husband	43 (14.05)	1 (0.56)
Unemployed	110 (35.95)	25 (13.97)
None-retired	2 (0.65)	
Salaried Employee	28 (9.15)	10 (5.59)
Skilled	7 (2.29)	41 (22.91)
Student	28 (9.15)	14 (7.82)

2.3. Survey questionnaires

A simple questionnaire, in local dialect, was developed and was divided into three parts. The first part of the questionnaire was the demographic data (shown in Table 1). Data like the age, gender, educational attainment, occupation and length of stay were generated. The second part focused on the perception and level of awareness of the respondents regarding the prevalence of schistosomiasis. Questions like local name for

schistosomiasis, sources of information about the disease, signs and symptoms felt by the victim, mode of transmission, possible area in the community where schistosomiasis can be transmitted, group at risk and family members infected with the disease. Lastly, the third part of the questionnaire was on the perceived severity of the disease and the attitudes towards interventions. In this part, the respondents were asked about their perception on the medical intervention provided by the government as well as any comments regarding the interventions.

3. Ethics statement

Before the study was conducted, the Provincial Health Officer of Lanao del Norte, Local Chief Executive of Lala, Lanao del Norte, and the Municipal Health Officer of the municipality were consulted on the objectives of the study. Ethical permission was sought and gotten and the study was then conducted to the 15 endemic villages. All information given by the study participants were kept confidential and anonymity was highly observed. No personal identifiers were used during data entry and analysis.

3.1. Data management and analysis

Data entry was done using Microsoft excel. Data were analyzed using Rsoftware for Biologist. Descriptive statistics including percentages and mean values were used to analyze data from the questionnaire. Frequencies and percentages were used to present categorical variables. Chi-square Test for Independence was used to compare proportion of awareness and perceptions.

4. Results

4.1. Perception and level of awareness

The majority of the respondents (87.09% female and 87.01% male) said that they heard of the occurrence of schistosomiasis in their area, commonly known as "sisto" (66.27%). The proportion of males who were aware of the occurrence of schistosomiasis was the same than that of the female respondents ($P=0.98$). Moreover, respondents belonging to age 51-60 bracket had the highest percentage of awareness (96.94%) compared to other age brackets. Subsequently, all respondents from Brgy, Darumawang Ylaya, El Salvador, and Pinuyak were aware on the occurrence of the disease in their locality while 60% of the respondents from Brgy. Tunaan were not aware that schistosomiasis is endemic in their place.

Most people cited common sources of information on the prevalence of the disease in the area were from neighbors (28.51%), medical team (19.76%) and government agencies (16.90%). Most of those who reported that they heard the occurrence of schistosomiasis in their area knew the correct signs and symptoms, however, responses

varied considerably. Of the 751 answers given, enlarged stomach (202 times, 26.90%), abdominal pain (58 times, 7.72%), and bloody stool (57 times, 7.59%) were most often mentioned. Various symptoms usually not associated with schistosomiasis (and not part of the health education messages from the Department of Health) were also reported (26.49%): bloated stomach (5 times), dizziness (12) dizziness after praziquantel medication (19), headache (38), yellowish coloration of the skin (5), weight loss (50), chills (5), vomiting (17), diarrhea (17), grumbling stomach (9), fainting (1), difficulty in breathing (1), weak immune system (2), worms in the feces (1), dry skin (1), enlargement of the feet (1), and sleeploss (1). While more than half (60.84%) of the respondents gave an adequate chronic symptoms (bloody stool, weakness and fever, paleness and stomachache) and acute symptoms (enlarged stomach, liver and spleen and convulsion), many added one or more non-schistosomiasis related symptoms (14.06%), and 14.51% could not mention any symptoms at all. Subsequently, there were no significant difference between both gender in providing adequate answers in the signs and symptoms of the diseases ($P=0.34$).

The 414 valid answers on the mode of transmission could be grouped into 'water contact' which included working in an infected rice field and drinking of water from the infected area (354 times), and 'non-water contact related activities' like eating of duck's eggs, kangkong, and fishes from the infected area, presence of garbage, and improper sanitation (60 times). More than half (64.15%) reported water contact as the only mode of transmission, 7.94% of the respondents answered both water and non-water-contact related activities, 4.28% answered only non-water-contact related activities and 23.62% gave a blank answer or an invalid answer. Both the male and female provided adequate answers on the mode of transmission ($P=0.84$).

Moreover, there was no significant difference in the responses between the male and female respondents ($P=0.26$) when asked about their awareness on the possible area in their locality where schisto can be acquired. Fifty-nine point sixty seven percent (59.67%) of the respondents confirmed that there were area in their community positive for schistosomiasis and had been a primary cause for infection in the area. Respondents in the age bracket 61-70 had the highest percentage of awareness (70.59%) while respondents aged 15-20 had the highest percentage (26.67%) of unfamiliarity.

Generally, everyone was perceived to be at risk, however, farmers were perceived to be most at risk (426), followed by children (494.5), poor families (709.5), fishermen (740) and those living near water bodies (935). In addition, two hundred-ninety respondents (59%) had family members or they themselves were positive for schistosomiasis.

4.2. Perceived severity of the disease and perception on medical interventions

In the Municipality of Lala, Lanao del Norte, 46.88% of the respondents perceived the disease to be under control. Nineteen point eleven percent (19.11%) said that schistosomiasis was no longer a problem in the area, 10.46% reported that it had worsen and the remaining 23.54% were either no answer or no idea. There was a significant difference in the answer between male and female respondents ($P=0.04$).

Consequently, 90.58% of the respondent received medical interventions for schistosomiasis control and treatment from mass drug administration given by the Department of Health to the different schools, villages, and business establishments in the municipality. In addition, 74.13% of the respondents were contented with the government's program for the control and treatment of schistosomiasis in the area. Positive comments were also received during the conduct of the study; people were thankful and contented with the well implemented medical interventions provided by the government of the Republic of the Philippines. However, an aggregate of 8.54% of the respondents said that there were gaps in the implementation of the program that needed to be given attention of. This included the enhancement and sustainability of the program where follow-up consultation should be done to assess the effectiveness of the treatment. They also emphasized the urgency to intensify the snail control programs as well as the desiltation of the river that can further reduce the favorable habitat of *Oncomelania quadrasi*, the shost snail of the schistosome parasite.

5. Discussion

Regardless of the gender, age and location of the respondents in this study, almost all had similar perception and level of awareness. However, significant difference was observed between male and female respondents on the perceived severity of the disease.

The study found out that the level of awareness of the people in the endemic villages of Lala, Lanao del Norte was high. Most of the respondents were aware of the occurrence of the disease (87.08%) and can articulate the correct signs and symptoms brought about by the infection (60.84%). These findings were in contrast to the findings of Odhiambo et al. (2014) and Legesse et al. (2009) where the level of awareness and knowledge of their respective participants were low. It was further observed that the high level of awareness of the people was the result of the intensive information, education campaign prior to the mass drug administration conducted by the Department of Health in the area since 2009, thus, resulting to the reduced number of prevalence per year. This observation was similar in the findings of Chaula et al. (2014) where the level of

knowledge of the school children improved after the effective MDA advocacy campaign.

Consequently, information on the occurrence of schistosomiasis was handed from the old generation to the present which was evident in the result of the study were the respondents answered 'neighbors' (28.51%) as the main source of information. Stories, tales and hear-says played an important role in the dissemination of information coupled with the IEC conducted in the area which increased the awareness level of the people. This result was in contrast to the findings of the study of Musuva et al., (2014) where majority of the participants reported having heard about schistosomiasis through schools. This may be attributed to the fact that most of the respondents were unemployed and venues for community gatherings were rampant. However, the result also showed the need to put greater attention in incorporating health promoting programs that can demonstrate to the student's information as to how they can protect themselves against infection and to further disseminate the information to the surrounding communities (Sady et al., 2015) especially those who can't get proper education. Moreover, schistosomiasis control and prevention measures can be linked with behavioral change, hence, the incorporation of health promoting programs in school curriculum will provide a longer follow-up period (Gyorkos et al., 2013) to change subsequent practices by the children that can expose them to the risk of getting schistosomiasis infection.

In addition to the information obtained by the people was about the mode of transmission. Respondents were highly aware that water contact with the ricefield, stagnant water in a polluted area and flood had been the source of the schistosomiasis strain. Respondents were fluent enough to narrate that most of the cases of schistosomiasis were mostly from the rice field. All people that can get in contact with it as well as on the water flowing from it will surely had a chance of exposure to the disease. This was similar to the result of the study conducted by Sow et al. (2003) where the respondents realized that the disease was somehow linked with water contact. However, the water contact activity of the people like rice farming, was not limited, even with the obtained knowledge, since it was the main economic source of the area, thus, making the farmers the most vulnerable group for the disease. Moreover, children exposed to these areas were also at high risk for the disease. This directly presuppose that provision of various snail control programs should be strictly implemented to reduce and further control the host snails causing the infection, thus, reducing the number of prevalence. On the other hand, the respondents perceived the disease to be under control which was confirmed by the Provincial Health Office of Lanao del Norte in their report that the prevalence rate of the disease was declining since 2009 (Table 2). However, the success rate of the mass drug administration was affected by the reported negative side effects of the praziquantel which includes dizziness, weakness and feeling of

unwell for a few days. It was observed that a number of few residents declined to take the medication for the fear of the said side-effects. They also had this misconception that those who were suffering from the harsh side effects were positive for schistosomiasis, thus, adding the refusal to take the drugs. It is therefore suggested that a study should be undertaken to confirm the said claim of the people and massive information campaign should be made to urge the people on the importance of these preventive measures. In addition, sustainability of the said program should be made to assure the control of the disease. In the Municipality of Lala,

Lanao del Norte, it was oblige that all household must have their own sanitary toilet. Budgets were given to the respective villages to provide toilet bowls to households without comfort rooms. Rewards from the municipal level were given to Village Local Government Units with zero open-defecation status, thus, motivating the villages to implement strict ordinances on sanitary toilets. In this connection, transmissions of schistosomiasis through open defecation were reduced, thus reducing the new incidence of infection.

Table 2: Schistosomiasis Prevalence Rate of Lanao del Norte

	2009	2010	2011	2012	2013
No. Examined	300	329	354	420	457
No. of schisto positive	30	37	17	14	20
No. Treated	30	37	17	14	20
Prevalence Rate	10.00%	11.24%	4.80%	3.33%	4.37%

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