ADOLESCENTS' INTENTION TO ENGAGE IN SCHISTOSOMIASIS PREVENTIVE BEHAVIORS: AN APPLICATION OF PROTECTION MOTIVATION THEORY IN AN ENDEMIC MUNICIPALITY IN ORIENTAL MINDORO

Jeanne A. Espiritu, Marites L. Gawad, Jenny B. Adriatico, Alona D. Flores, Ara-Mae T. Gozar, Marilyn M. Adion, Sarah Jane M. Paguagan, Arnold Jann L. Cariaso
College of Arts, Sciences, and Technology
Occidental Mindoro State College
marcjhuls.0706@gmail.com

ABSTRACT

In tropical and subtropical countries, schistosomiasis is a neglected tropical illness that typically affects impoverished rural communities, particularly those with agricultural and fishing populations. Victoria being one of the endemic Municipalities in Oriental Mindoro, adolescents are at risk of infection due to their cognitive and physical development stage. This study investigated adolescents' intention to engage in schistosomiasis preventive behaviors in endemic communities of Victoria, Oriental Mindoro, Philippines, using the Protection Motivation Theory (PMT). A descriptive correlational design was employed among 338 adolescents aged 12-19 from 13 barangays. Results indicated a low level of schistosomiasis knowledge among adolescents, with 78.7%. However, they demonstrated a "likely" intention to adopt protective measures in both short-term (3.75±1.14) and long-term (3.81±1.16) scenarios. Adolescents perceived high severity (3.47±0.96) and vulnerability (3.55±1.06) to schistosomiasis, showing strong awareness of the threat. Intrinsic and extrinsic rewards, and response cost, presented neutral scores, suggesting mixed perceptions. Significant correlations were found between PMT constructs and behavioral intentions. Severity, vulnerability, response efficacy, and self-efficacy significantly correlated with both short-term and long-term intentions. The study highlights the need for targeted health education interventions, leveraging social media and healthcare providers, to enhance knowledge and translate awareness into consistent preventive behaviors among adolescents in schistosomiasis-endemic areas.

Keywords: *adolescents, behavioral intention, endemic communities, protection motivation theory, schistosomiasis*

SDG: *SDG 3: Good Health and Well-being*

Vol. 4, No. 1, June 2025 | pISSN:2980-4523 | eISSN: 3027-9054

INTRODUCTION

Schistosomiasis is one of the neglected tropical diseases commonly found in tropical and subtropical regions that affects approximately 240 million people worldwide, with more than 700 million people living in endemic areas in 78 countries. It usually affects poor rural areas, especially agricultural and fishing populations. Schistosomiasis *Japonicum* is an intestinal schistosomiasis highly endemic in 28 out of 81 states and distributed in 12 out of 18 regions (WHO, 2020).

The Philippines recorded about 12 million people in 1,599 barangays which are at risk of infection, and 2.5 million people are directly exposed to 3,012 slug-infested bodies of water, which makes S. *japonicum* a serious national public health problem. Oriental Mindoro, having 4 endemic municipalities, 33 barangays, and 44,528 populations were recorded endemic with this disease. Moreover, Victoria is out of the 4 endemic municipalities with 13 endemic barangays documented with a total number of 256 positive cases which is characterized by a high transmission rate brought by the continuous rainfall and subsequent floods which facilitate the spread of schistosomiasis (Municipal Epidemiology and Surveillance Office Victoria, 2020). Given the widespread prevalence of schistosomiasis in endemic areas, certain populations face a higher risk of infection. Adolescents are at increased risk of infection because they're in the stage of imbalance between cognition and physical development. More risk-taking and less protective behavior is expected among adolescents living where schistosomiasis is endemic.

Adolescents tend to do swimming, bathing, washing, and other recreational activities in places where schistosomiasis is endemic. Aside from its general health impact, schistosomiasis also poses serious reproductive health risks, particularly for women. Since schistosomiasis penetrates the skin of the human body in contact with water it can reside in blood vessels of humans and it can form disease in women. Eggs can be deposited in the tissue of the cervix and lower female genital tract that can lead to intravaginal lesions resulting genital itching, pain, bleeding as well as dyspareunia. Moreover, eggs deposited in the uterus and fallopian tubes can lead to infertility (Klohe et al., 2021; Xiao et al., 2016). Additional high-risk factors, such as children's play habits, insufficient sanitation facilities, and poor hygiene, have made people more vulnerable to getting the parasite. There have also been reports of anemia, hunger, growth retardation, poor cognitive function, and mortality connected to S. Infections with japonicum were also reported.

Effective disease management relies on accurate detection and prevention strategies. To date, schistosomiasis has been identified using procedures such as ultrasonography, polymerase chain reaction, circumoral precipitin test, and enzyme-linked immunosorbent assay, all of which have higher sensitivity and specificity. Furthermore, eDNA detection helps with surveillance, resulting in an integrated, multidisciplinary, "one health" approach to disease prevention and eradication (Chan et al., 2021). Schistosomiasis infection could be reduced by improving sanitation, informing those infected with schistosomiasis not to defecate on freshwater, lakes, rivers, and canals, and advising people living in endemic areas to wear foot protection when visiting infected sites, always participating in a government's Mass Drug Administration Program, and examining stool (Kato Katz) to determine if they are infected with schistosomiasis. With the alarming impacts associated with schistosomiasis, this study aimed

Vol. 4, No. 1, June 2025 | pISSN:2980-4523 | eISSN: 3027-9054

to assess the knowledge and protective behavior of adolescents related to schistosomiasis infection and to enhance their awareness. Specifically, (1) to determine the characteristics of adolescents; (2) to describe the level of knowledge on schistosomiasis; (3) to describe the intention to take protective measures against schistosomiasis; (4) to describe the protective motivation; (5) to test the correlation between protection motivation with knowledge and intention to take protective measures against schistosomiasis.

METHOD

Study Design

The study used a descriptive correlational design to determine the respondent's characteristics, level of knowledge, and level of intention. Moreover, descriptive correlation would employ to explain the relationship between adolescents' characteristic knowledge and their intention to take protective measures against schistosomiasis.

Study Setting

The study was conducted in 13 *Barangays* of Municipality of Victoria, Province of Oriental Mindoro which are Bethel, Canaan, Duongan, Liedo, Malabo, Pakyas, Poblacion I, Poblacion II, Poblacion III, San Gelacio, San Isidro, San Narciso, and Urdaneta. The research was conducted on these places as it is known to be endemic for schistosomiasis. The risk of exposure to schistosomiasis is significantly higher in these communities because of surrounding bodies of water like the Naujan Lake, rivers, and some are irrigated rice fields making it endemic to schistosomiasis due to the presence of freshwater bodies that provide a suitable habitat for the intermediate host of the Schistosoma parasite–freshwater snails.

Unit of Analysis and Sampling

The data was collected between March 2024 and April 2024. Participants were adolescents within the 13 endemic *barangays* in the locality of Victoria. From a total adolescent population of 5,759 based on the 2024 census provided by the Municipal Planning and Development Office of Victoria, the researchers used OpenEpi version 3 open-source calculator, with a 95% confidence level, and they used stratified random sampling to select 338 samples drawn from a population of adolescent respondents of the study. The researcher stratified the population by site/location, creating 13 strata representing the 13 communities. A stratified sampling was utilized to choose subjects within each 13 groups, selecting a roughly equal representation of the population. The respondents in this study are considered vulnerable populations due to their status as adolescents living in endemic communities affected by schistosomiasis.

Research Instrument

The adolescent's demographic profile, which includes age, sex, educational attainment, place of living, and information source, was utilized by the researcher.

Using PMT (Xiao et al., 2016), which consists of seven components arranged as two group (the threat appraisal pathway and the coping appraisal pathway) connecting perceptions to behavior, the intention of adolescents to participate in protective behavior was measured. The

Vol. 4, No. 1, June 2025 | pISSN:2980-4523 | eISSN: 3027-9054

four elements that make up the threat appraisal pathway are divided into two groups: intrinsic rewards and extrinsic rewards, severity and vulnerability. The self-efficacy, response costs, and response efficacy subconstructs are the three subconstructs that make up the two groups of the coping appraisal route. The primary technique for gathering data for this study was the PMT questionnaire. Adolescents from 13 endemic barangays (communities) in the Municipality of Victoria, Oriental Mindoro were surveyed using this tool. The researcher used the PMT questionnaire as the main vehicle to gather data for this research. The research instruments in this study were survey forms used to capture the answers of the adolescents within the 13 endemic barangays in the locality. To determine the correlation between the socio-demographic profiles of the respondents to the schistosomiasis infection.

Data Collection Procedure

The study employed a survey method using structured questionnaires to collect data from adolescents residing in 13 endemic barangays. The data collection period spanned from March 2024 to April 2024. Prior to the administration of the survey, the researchers followed a systematic data-gathering procedure to ensure ethical compliance and accuracy in data collection.

Before conducting the survey, the researchers coordinated with barangay officials and local health workers to facilitate community engagement and respondent identification. An initial orientation session was held to explain the purpose of the study, the significance of the research, and the procedures involved in data collection. The researchers secured informed consent from the parents of respondents before administering the questionnaires. As minors, they are particularly vulnerable to coercion and may have limited capacity to fully understand the research process, its potential risks, and benefits, thus, respondents were informed of the contents of the survey form, the study's objectives, the voluntary nature of participation, confidentiality measures, and the rights of the respondents, including their right to withdraw at any time without consequences. The surveys were conducted in a face-to-face setting per barangay, ensuring that respondents fully understood the questions. Researchers provided guidance when necessary while maintaining neutrality to prevent response bias. The collected questionnaires were reviewed on-site for completeness before being securely stored for further analysis.

Data Processing and Analysis

The survey data was manually entered into the computer after a quality check using Microsoft Excel. The double-entry protocol was imposed to minimize data-entry errors. Discrepancies from double entries were resolved by consulting the hard copies of the originally completed questionnaires. Frequency and percentage were used to summarize the sample characteristics. Pearson correlation coefficients were computed to assess the relationship among the variables for structural equation modeling analysis with a p-value of 0.05

Ethical Considerations

Several ethical considerations were carefully addressed to ensure the rights and welfare of participants are protected. First, the survey protocol was approved by the Institutional Research Board of Occidental Mindoro State College, San Jose Occidental Mindoro.

Vol. 4, No. 1, June 2025 | pISSN:2980-4523 | eISSN: 3027-9054

First, informed consent was essential for the study, particularly because it involved adolescent participants. The study ensured that participants, as well as their parents or guardians, were fully informed about the research purpose, procedures, potential risks, and benefits before agreeing to participate. Written consent was obtained from parents or guardians of participants, in accordance with ethical guidelines for research involving minors.

Additionally, the confidentiality and privacy of the participants were safeguarded by assigning unique identifiers to all survey data and ensuring that no personal information was disclosed without explicit consent. Data were stored securely, and access was restricted to researchers only. Participants were also informed that their participation was voluntary and that they could withdraw from the study at any time without any consequences. The study was conducted with the utmost respect for the participants' dignity, privacy, and well-being while contributing meaningful knowledge to the field of health behavior. Special attention was also paid to minimizing any potential risks associated with their involvement in the study.

RESULTS

Table 1. Demographic characteristics

	Profile	Frequency	Percentage
Sex	Male	165	48.8
	Female	173	51.2
Age	12 – 15 y/o	227	67.16
	16 - 19 y/o	111	32.84
Educational Level	Elementary level	81	24.0
	High school level	175	51.8
	Senior high school level	70	20.7
	College level	11	3.3
	Out-of-school youth	1	.3
Place of Living	Near Naujan Lake	57	16.86
	Near Rivers	229	67.75
	Near Irrigated Rice Fields	52	15.39
Sources of Schistosomiasis Information	Social media	128	12.8
	Mass media	16	1.6
	Health agencies	122	12.2
	Healthcare providers	95	9.5
	Family/ friends	4	.4

The findings show that respondents of the study are slightly more females (51.2%) than males (48.8%), indicating a low level of gender bias. The majority of responders are young (67.16%) and are in high school (51.8%). Participants living near rivers (67.75%) have the most participation with social media (12.8%) as the most prevalent source of knowledge on schistosomiasis [Table 1].

Results reveal a low level of general knowledge about schistosomiasis among respondents. It shows that the majority of participants (78.7%) had a low level of knowledge,

while a smaller proportion (18.9%) demonstrated a medium level of knowledge. Only 2.4% of participants exhibited a high level of knowledge [Table 2].

Table 2. Level of knowledge on schistosomiasis among adolescents in the Municipality of Victoria, Oriental Mindoro.

Level of Knowledge	Frequency	Percentage
High	8	2.4
Average	64	18.9
Low	266	78.7

Findings show that with short-term intentions, respondents are likely (3.75±1.14) to avoid contact with snail-conditioned water, using protective measures when necessary. Long-term showed (3.81±1.16) likely intention to take protective measures over the long term [Table 3].

Table 3. Intention to take protective measures against schistosomiasis among adolescents in the Municipality of Victoria, Oriental Mindoro.

Intention to Take Protective Measures	Mean	SD
Short-Term (3 Months)	3.75	1.14
Long Term (12 Months)	3.81	1.16

Scale: 1.00-1.79 (Very Unlikely); 1.80-2.59 (Unlikely); 2.60-3.39 (Unsure); 3.40- 4.19 (Likely); 4.20-5.00 (Very Likely)

Result shows a strong awareness of the disease's severity and vulnerability among adolescents. They generally agree that schistosomiasis can cause significant health problems and that their families would suffer if they were infected. The severity (3.47±0.96), vulnerability (3.55±1.06), response efficacy (3.46±1.00) and self-efficacy (3.51±1.11) are highly agreed. While neutral scores indicate that the respondents showed intrinsic reward (2.99±1.00), extrinsic reward (2.85±1.03) and response cost (2.99±1.03) [Table 4].

Table 4. The protective motivation of Schistosomiasis among adolescents in the Municipality of Victoria, Oriental Mindoro.

Protective Motivation	Mean	SD
Severity	3.47	.96
Vulnerability	3.55	1.06
Intrinsic Reward	2.99	1.00
Extrinsic Reward	2.85	1.03
Response Efficacy	3.46	1.00
Self-Efficacy	3.51	1.11
Response Cost	2.99	1.03

Scale: 1.00-1.79 (Strongly Disagree); 1.80-2.59 (Disagree); 2.60-3.39 (Neutral); 3.40 4.19 Agree 4.20-5.00 (Strongly Agree)

In further analysis, threat appraisal constructs show a strong correlation between severity and vulnerability ($r = .702$, $p < 0.01$), while intrinsic and extrinsic rewards are also positively correlated ($r = .495$, $p < 0.01$). Severity is significantly associated with short-term

Vol. 4, No. 1, June 2025 | pISSN:2980-4523 | eISSN: 3027-9054

behavior intention (r = .646, p < 0.01) and long-term protective behavior intention (r = .577, p < 0.01). Similarly, vulnerability correlates strongly with short-term (r = .709, p < 0.01) and long-term behavior intention (r = .625, p < 0.01). Coping appraisal constructs show a strong correlation between response efficacy and self-efficacy (r = .723, p < 0.01), while response cost has a weaker but significant relationship with self-efficacy (r = .322, p < 0.01). Response efficacy and self-efficacy are both significantly associated with short-term (r = .570, r = .647, p < 0.01, respectively) and long-term behavior intention (r = .583, r = .636, p < 0.01, respectively). Response cost has weaker but significant correlations with short-term (r = .154, p < 0.01) and long-term behavior intention (r = .145, p < 0.01). Among predictor variables, self-efficacy (r = .647), severity (r = .646), vulnerability (r = .709), and response efficacy (r = .570) all significantly correlate with short-term behavior intention, while response efficacy (r = .583) and self-efficacy (r = .636) are strongly linked to long-term protective behavior intention [Table 5].

Table 5. The relationship between schistosomiasis PMT sub-contracts with behavioral measures of adolescents in Municipality of Victoria, Oriental Mindoro.

	Variables	2	3	4	5	6	7	8	9	10
1.	Severity	.702**	.200**	-.006	.543**	.602**	.317**	.011	.646**	.577**
2.	Vulnerability		.124*	-.098	.670**	.692**	.182**	.013	.709**	.625**
3.	Intrinsic Reward			.495**	.204**	.144**	.408**	.132*	.076	.077
4.	Extrinsic Reward				-.013	-.015	.433**	.076	-.083	-.088
5.	Response Efficacy					.723**	.291**	.039	.570**	.583**
6.	Self-Efficacy						.322**	-.046	.647**	.636**
7.	Response Cost							.118*	.154**	.145**
8.	Knowledge								.014	.078
9.	Short-term Behavior Intention									.791**
10.	Long-term Protective Behavior Intention									

***Correlation is significant at the 0.01 level (2-tailed).*
** Correlation is significant at the 0.05 level (2-tailed).*

Discussion

The study was specifically designed to investigate the characteristics of adolescents in endemic areas, their knowledge levels regarding schistosomiasis, and their attitudes towards protective behaviors using the constructs of Protective Motivation Theory. Awareness and preventive efforts should be targeted toward younger adolescents to establish early health-conscious behaviors. Adolescents in the area are at crucial educational stages where health awareness interventions can be most impactful. There may be a chance for focused educational initiatives given the high school age of the majority of participants given age as moderator of motivation (Xiao et al., 2014). The low percentage of out-of-school youth among the participants suggests that formal education plays a key role in providing health education and information dissemination. Since schistosomiasis is mainly spread through freshwater sources, the geographic location of these communities puts adolescents at a greater risk of exposure to the disease. This finding emphasizes the importance of improving environmental and water sanitation in high-risk areas to help reduce transmission. However, factors like environmental exposure and economic challenges make it harder for individuals to take protective measures (Lund et al., 2021).

Reliance on modern communication channels for health information, emphasizing the need for targeted health campaigns through social media and healthcare institutions. Traditional mass media and personal networks, such as family and friends, have only a limited influence in spreading awareness about the disease. The decreasing reliance on these traditional sources suggests a shift in how people access information (Bottemanne et al., 2021). To effectively reach communities, health agencies, and providers need to adjust their outreach strategies to match modern communication preferences (Assefa et al., 2021; Hambury et al., 2021; Parisi et al., 2019). Healthcare providers and personal networks play a vital role in raising awareness, suggesting that educational outreach should focus on more official channels. However, the results of our study showed that only a few have obtained information from healthcare providers, which could also be the cause of inadequate knowledge or misconceptions about schistosomiasis (Lwin et al., 2007).

The low knowledge levels suggest that existing health education efforts may be insufficient or not effectively reaching adolescents. Since knowledge is a key factor in influencing behavior, enhancing educational interventions is vital for increasing awareness and encouraging preventive actions. Health education programs should engage both schools and communities, equipping schoolchildren to act as messengers who share important health information within their communities (Musuva et al., 2014b).

The high level of awareness among participants indicates that educational campaigns have been somewhat effective in increasing knowledge about the disease. As suggested by the core principles of Protection Motivation Theory (PMT), individuals are more likely to take protective actions when they recognize both the severity of a threat and their own vulnerability to it (Xiao et al., 2014, 2016). Adolescents' strong belief in the effectiveness of preventive measures, along with their confidence in carrying them out, is a good indicator. This positive mindset suggests they are more likely to adopt protective behaviors. However, it is important to determine whether these beliefs actually translate into real-life actions. Challenges such as reliance on contaminated water sources and misunderstandings about mass drug administration (Anyolitho et al., 2022; Assefa et al., 2021) need to be addressed to ensure that awareness and intention lead to lasting behavioral change.

Adolescents have mixed feelings about whether avoiding infection brings them internal satisfaction (intrinsic reward) or external benefits (extrinsic reward). This contrasts with previous studies which stated that rewards can sometimes lead people to engage in risky behaviors instead (Floyd et al., 2000). As indicated, social media seems to serve as an extrinsic motivator for sharing health information, presenting a valuable opportunity to promote preventive behaviors through social recognition and community engagement.

The correlation analysis of Protection Motivation Theory (PMT) subconstructs reveals significant relationships between threat and coping appraisal constructs (Xiao et al., 2016). A strong correlation between severity and vulnerability suggests that adolescents who perceive Schistosomiasis as severe also acknowledge their susceptibility to infection. Furthermore, the positive correlation between intrinsic and extrinsic rewards implies that adolescents who find internal satisfaction in taking preventive measures also tend to recognize the external benefits.

Vol. 4, No. 1, June 2025 | pISSN:2980-4523 | eISSN: 3027-9054

The strong correlation between perceived severity, vulnerability, and behavioral intentions indicates that those who see Schistosomiasis as a serious threat are more likely to adopt preventive behaviors (Marikyan et al., 2023). Similarly, coping appraisal factors show a strong connection between response efficacy and self-efficacy, meaning that those who trust in the effectiveness of preventive measures also feel confident in their ability to carry them out. The correlation between response efficacy, self-efficacy, and both short-term and long-term intentions emphasizes the need to build confidence in preventive behaviors. When adolescents trust that prevention is effective and feel capable of taking action, they are more likely to maintain protective habits over time.

CONCLUSION

The study explored several key aspects related to schistosomiasis among adolescents in the Municipality of Victoria, Oriental Mindoro which led to the following conclusions. There is a balanced distribution of males and females, a majority in the high school age range, and varying levels of educational attainment. The majority of them live near rivers which heightened the risk of exposure among these adolescents. The findings also highlighted the primary sources of information on schistosomiasis, with social media emerging as the most significant, suggesting a shift in how adolescents access health information. There is a low level of general knowledge about Schistosomiasis among respondents. Adolescents had varying intentions to adopt protective measures against schistosomiasis, with long-term intentions (6 months) generally being higher than short-term intentions (3 months).

The findings also reveal a strong correlation between different aspects of the Protection Motivation Theory (PMT) and their impact on both short-term and long-term intentions to engage in protective behaviors. In terms of threat appraisal, adolescents who felt more vulnerable to schistosomiasis and recognized its severity were more likely to consider taking preventive action. Similarly, those who found both personal satisfaction (intrinsic rewards) and external benefits (extrinsic rewards) in protective behaviors showed a positive link between these two factors.

When it came to coping strategies, confidence played a crucial role–adolescents who believed in the effectiveness of prevention (response efficacy) and felt capable of carrying it out (self-efficacy) were more likely to commit to protective behaviors, both in the short and long term. While concerns about barriers, such as cost or inconvenience, had a weaker influence, they still played a role in shaping behavior, suggesting that reducing perceived obstacles (barriers) could further encourage preventive action.

Based on the study findings, it is recommended that tailored interventions be developed to enhance preventive practices among adolescents in the Municipality of Victoria, Oriental Mindoro. These interventions should focus on increasing awareness by implementing targeted educational campaigns through social media and health agencies to improve knowledge about schistosomiasis and its prevention. Public health messaging should be strategically placed in digital and institutional health channels such as the social media page of the rural health unit of for maximum reach. One specific way to address potential barriers and reinforce the benefits of continuous protective behaviors is to implement a community-based program (CBP)

which may include distribution of free or subsidized protective footwear, gloves, and safe water containers to reduce direct exposure to contaminated water sources. Free deworming treatments and priority medical check-ups are also recommended.

The benefits of adopting preventive behaviors against schistosomiasis must be emphasized, highlighting the positive outcomes of protective measures. Training programs on proper hygiene, use of protective gear (e.g., footwear in contaminated water), and access to preventive treatment should be implemented. Programs should prioritize individuals who are most vulnerable, such as children, farmers, and those living near lakes, rivers, and irrigated rice fields. Additionally, the local government of Victoria should integrate protective measures with economic benefits, such as safe water initiatives for irrigation and alternative livelihood training (e.g., aquaculture in non-contaminated water sources). This ensures that communities still have access to income-generating activities without risking exposure to Schistosomiasis. By implementing these recommendations, stakeholders can effectively promote behavior change and improve health outcomes among adolescents in the Municipality of Victoria, Oriental Mindoro, in the fight against schistosomiasis.

REFERENCES

Anyolitho, M. K., Poels, K., Huyse, T., Tumusiime, J., Mugabi, F., Tolo, C. U., Masquillier, C., & Nyakato, V. N. (2022). Knowledge, attitudes, and practices regarding schistosomiasis infection and prevention: A mixed-methods study among endemic communities of western Uganda. *PLoS Neglected Tropical Diseases*, *16*(2), e0010190. https://doi.org/10.1371/journal.pntd.0010190

Assefa, A., Erko, B., Gundersen, S. G., Medhin, G., & Berhe, N. (2021). Low awareness and common misconceptions about schistosomiasis in endemic lowland areas in Western Ethiopia: a mixed-methods study. *BMC Public Health*, *21*(1). https://doi.org/10.1186/s12889-021-11106-y

Bottemanne, H., & Friston, K. J. (2021). An active inference account of protective behaviours during the COVID-19 pandemic. *Cognitive Affective & Behavioral Neuroscience*, *21*(6), 1117–1129. https://doi.org/10.3758/s13415-021-00947-0

Floyd, D. L., Prentice-dunn, S., & Rogers, R. W. (2000). A Meta-Analysis of Research on Protection Motivation Theory. *Journal of Applied Social Psychology*, *30*(2), 407–429. https://doi.org/10.1111/j.1559-1816.2000.tb02323.x

Hambury, S. D., Grobler, A. D., & Melariri, P. E. (2021). Knowledge, Attitudes, and Practices on Urinary Schistosomiasis among Primary Schoolchildren in Nelson Mandela Bay, South Africa. *Journal of Parasitology Research*, *2021*, 1–12. https://doi.org/10.1155/2021/6774434

Klohe, K., Koudou, B. G., Fenwick, A., Fleming, F., Garba, A., Gouvras, A., Harding-Esch, E. M., Knopp, S., Molyneux, D., D'Souza, S., Utzinger, J., Vounatsou, P., Waltz, J., Zhang, Y., & Rollinson, D. (2021). A systematic literature review of schistosomiasis in urban and peri-urban settings. *PLoS Neglected Tropical Diseases*, *15*(2), e0008995. https://doi.org/10.1371/journal.pntd.0008995

Lund, A. J., Sokolow, S. H., Jones, I. J., Wood, C. L., Ali, S., Chamberlin, A., Sy, A. B., Sam, M. M., Jouanard, N., Schacht, A., Senghor, S., Fall, A., Ndione, R., Riveau, G., De Leo, G. A., & López-Carr, D. (2021). Exposure, hazard, and vulnerability all contribute to Schistosoma

haematobium re-infection in northern Senegal. *PLoS Neglected Tropical Diseases*, 15(10), e0009806. https://doi.org/10.1371/journal.pntd.0009806

Lwin, M. O., & Saw, S. (2007). Protecting Children from Myopia: A PMT Perspective for Improving Health Marketing Communications. *Journal of Health Communication*, 12(3), 251–268. https://doi.org/10.1080/10810730701266299

Marikyan, D., & Papagiannidis, S. (2023). Protection Motivation Theory: A review. In S. Papagiannidis (Ed.), *TheoryHub Book:* This handbook is based on the online theory resource: TheoryHub (pp. 78-93) https://open.ncl.ac.uk/theory-library/TheoryHubBook.pdf

Musuva, R. M., Awiti, A., Omedo, M., Ogutu, M., Secor, W. E., Montgomery, S. P., Alaii, J., & Mwinzi, P. N. M. (2014). Community Knowledge, Attitudes and Practices on Schistosomiasis in Western Kenya-The SCORE Project. *American Journal of Tropical Medicine and Hygiene*, *90*(4), 646–652. https://doi.org/10.4269/ajtmh.13-0488

Parisi, S., Mazigo, H. D., Kreibich, S., Puchner, K., Kasang, C., & Mueller, A. (2019). Factors associated with relevant knowledge of intestinal schistosomiasis and intention to participate in treatment campaigns: a cross sectional survey among school children at Ijinga Island on Lake Victoria, North-Western Tanzania. *BMC Public Health*, *19*(1). https://doi.org/10.1186/s12889-019-8091-4

Xiao, H., Li, S., Chen, X., Yu, B., Gao, M., Yan, H., & Okafor, C. N. (2014). Protection Motivation Theory in Predicting Intention to Engage in Protective Behaviors against Schistosomiasis among Middle School Students in Rural China. *PLoS Neglected Tropical Diseases*, *8*(10), e3246. https://doi.org/10.1371/journal.pntd.0003246

Xiao, H., Peng, M., Yan, H., Gao, M., Li, J., Yu, B., Wu, H., & Li, S. (2016a). An instrument based on protection motivation theory to predict Chinese adolescents' intention to engage in protective behaviors against schistosomiasis. *Global Health Research and Policy*, *1*(1). https://doi.org/10.1186/s41256-016-0015-6

Zhang, K. (2019). Bridging the gap on schistosomiasis: A cross-sectional study examining the knowledge gap and common attitudes and practices regarding S. mansoni infections among varying education levels in Luanda K'Otieno, western Kenya. *SIT Digital Collections*. https://digitalcollections.sit.edu/isp_collection/3129/