KNOWLEDGE AND ATTITUDES OF SCHOOL GOING CHILDREN TOWARDS DE-WORMING IN ONE OF THE SCHOOLS IN THE MANZINI REGION IN ESWATINI

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ABSTRACT

Worms continue to be part and parcel of everyone's childhood. Soil transmitted helminthic infections are among the most common infections in humans. School going children are a high risk group as prevalence and intensity peak in 5–14 year age group. The study described knowledge and attitudes of school going children towards de-worming in one of the primary schools in Manzini region. A quantitative-descriptive approach was employed in this study with a total of 50 participants, selected using random sampling. All participants were aged 10 to 14 years between Grade 4 and 7. A researcher-administered questionnaire was used. Data were analysed using descriptive statistics through Statistical Package for Social Sciences (SPSS). Ninety-eight percent (98%, n = 49) participants had heard about de-worming, and major sources of information dissemination about de-worming were nurses in clinics and school teachers. Knowledge on symptoms of soil transmitted infections was high, but there was knowledge deficit on modes of transmission as a majority of participants were not aware of major modes of transmission. About (52%, n = 26) participants reported that de-worming programmes are really effective and they should continue. Fifty-six percent (56%, n = 28) of participants reported that teachers were not suitable to give de-worming tablets because they were not knowledgeable about pharmacology and could not manage side effects. This study shows a relatively moderate level of knowledge about de-worming among children. In addition, pupils had a negative attitude towards teachers administering the de-worming tablets thus they ended up not deworming.

KEYWORDS: Worms, de-worming, knowledge, attitudes.

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INTRODUCTION

Worms have been and still continue to be part and parcel of everyone's childhood and soil transmitted helminthic infections are among the most common infections in humans. According to the Ministry of Health (2017), globally, soil-transmitted helminthic (STH) infestations (Ascaris lumbricoides, Trichuris trichiura, and hookworm) constitute one of the most important neglected tropical disease clusters of our time. They affect over two billion people and cause significant morbidity and disability (Ministry of Health, 2017).

In addition, school-age children are considered the highest risk group as STH prevalence and intensity peak in the 5–14 year age group. STHs are the leading cause of physical and intellectual growth as well as development delays and impairment of children in endemic areas. The World Health Organization (WHO) (2015) and The World Bank (2003), among others, recommended de-worming programmes targeted to school going children as the most cost-effective means to combat STH burden of disease. In short, this reflects that there is high burden of soil transmitted helminthic and it's an issue of concern worldwide.

Mass de-worming campaigns of school children have been used both as a preventive as well as a treatment method for helminthiasis, which includes not only soil transmitted helminthiasis but schistosomiasis in children (Maseko et al., 2018). In addition, good health improves school attendance and increase educational enrichment. Also, it is of note that children that suffer from chronic worm infestations struggle as they miss school on days when they feel ill. Absenteeism easily becomes an issue when they miss out on school work and activities. So by de-worming children, the exercise effectively reduces the overall spread of worm infestations in the community. Treated and untreated children benefit from this, by improving the health and participation of school going children. As a result, treating school going children can reduce the total burden of disease due to intestinal worm infestations by 70% in the community as a whole (Maseko et al., 2016). This shows some of the positive effects of de-worming in children.

In developing countries especially, worm infestations have been the leading reason young children are admitted to hospital due to abdominal emergencies. De-worming practices used in developing nations to eliminate intestinal worms are highly beneficial to children. Through removing the worms, the children are more likely to continue attending school regularly and become highly productive as they grow up (Vercruysse et al., 2011).To sum up, the use of de-worming drugs in children in trying to eliminate the intestinal worms is really a benefit to their health status.

In a study carried out by Lu et al. (2015) on knowledge, attitudes, and practices regarding Soil-Transmitted Helminthices, it was reported that there was lack of awareness about STHs, whereby parents, grandparents, and children were all unaware and highly skeptical of the fact that STH infestation was common in children. Furthermore, there was a belief that STHs were essential for digestion and that every person from children to adults harboured some STHs.

Furthermore, Parikh et al. (2013) conducted a study which revealed that more than 90% of parents and teachers held favourable attitudes towards multi-drug administration (MDA). In addition, 69% of parents and 75.5% of teachers believed that stool exams were necessary before MDA. On the contrary, 37% of parents stated they would not allow teachers to administer de-worming tablets and 91.5% of parents feared teachers would not detect side effects of the medication.

Additionally, 48% of teachers felt they could safely give de-worming tablets and 81.4% of teachers were afraid of managing the side effects of de-worming tablets. Furthermore, 47% of parents and 42.2% of teachers revealed that defecation in the open occurred in their community. Although attitudes toward STH control were largely favorable, misconceptions about the MDA strategy, lack of support for teachers giving de-worming tablets, and the practice of open defecation still exist as barriers to STH control efforts.

In Eswatini, there is a School Health Programme for de-worming campaign of which its mandate is to curb morbidity and mortality related to worm infestations with provision of mass preventive chemotherapy (de-worming) using the anthelminthic tablet Albendazole 400mg for soil transmitted helminthiciasis (STH) control. This is done through repeated routine or regular control-dose treatment with inexpensive, single-dose and highly effective drugs, so safe that it can be given to all age groups at risk (Ministry of Health, 2017). So this means that the country is keen to improve provision of and increase access to essential, affordable, and quality de-worming services in order to reduce the burden of disease, morbidity and mortality as well, improve the health status of the population exposed to worm infestations. It is also noted that the de-worming exercise meets the Millennium Development Goal that is similar to vision 2022 goal number 4 which is to reduce child mortality (Ministry of Health, 2017).

Even though the country has put up several strategies to prevent and control worm infestations such as mass de-worming campaigns, children keep suffering from worm infestations as noted that about 200 000 people die of worm infestation per year globally (World Health Organization, 2015). The author further noted that Swazi children are more susceptible to heavy worm infestation associated with malnutrition, poor growth and anemia. This could be associated with the lack of knowledge, attitude, access or motivation and could lead to increased child morbidity and mortality rates as the immune system often responds to parasitic worms by inhibiting the T-helper cells. Consequently, diseases like hepatitis, tuberculosis, HIV, and malaria worsen the situation leading to death (Kamal & Khalifa, 2012). Since there is insufficient literature on knowledge and attitudes among school going children aged 10 to 14 years old on the importance of de-worming, hence the study. Thus, the purpose of the study was to describe knowledge and attitudes of school going age children between the ages of 10 to 14 years towards de-worming in one of the primary schools in the Manzini region of Eswatini.

Significance of study

Nursing education: The study will inform the nursing curriculum so that nursing students may be competent in the education of children about de-worming drugs to eliminate negative attitudes and perceptions on deworming.

Nursing practice: The study will inform nursing practice so as to formulate effective strategies for de-worming in areas of persistently high STH rates.

Nursing research: This study will serve as a foundation on which further research concerning knowledge and attitudes of children towards de-worming will be conducted in future.

Nursing management: The findings of the study will inform management on knowledge and attitudes of children on de-worming thus encourage development of effective de-worming campaigns.

REVIEW OF RELATED LITERATURE

De-worming children can effectively reduce the overall spread of worm infestations in the community. De-worming and treating school age children can reduce the total burden of disease due to intestinal worm infestations by 70% in the community as a whole (WHO, 2016). Nampijja (2017) argues that treated and untreated children benefit from deworming by improving the health and participation of school going children; thus, leading to good school performance.

On another note, Njomo et al. (2016) in their study reported that pre-school teachers had adequate knowledge of STHs cause, signs and symptoms, treatment as well as preventive methods. However, Maseko et al. (2014) concluded that children have moderate knowledge about worm infestations. Moreover, Senghor et al. (2014) reported that a vast number of children are reported to have insufficient knowledge on transmission of soil transmitted helminthes.

Jimam et al. (2013) conducted a cross sectional study among residents of Plataeu state in Nigeria, they reported that most people had good knowledge of worm infestation; however, females had a better knowledge than males. In addition, most respondents have heard about worm infestation, and knew that they were the largest intestinal human parasites. On the contrary, Stanley, Oreh and Johnson-Ajinwo (2013) revealed that there's association between level of education and knowledge of deworming.

Additionally, Masaku et al. (2017) also noted that a majority of participants had inadequate knowledge on modes of worm transmission and reported that worms were caused by eating cold food and bathing in dams. Hence, few reported that the disease was caused by walking bare footed, drinking untreated water, eating soil, open defecation, eating undercooked vegetables and meat. On another note, children receive information on de-worming from school teachers (Maseko et al. 2018) Furthermore, participants in Masaku et al. (2017) lacked knowledge about signs and symptoms of STHs infestation. Knowledge gap was identified on areas such, causes, treatment, prevention and control measures, transmission and risk factors to worm infestation. Similarly, Sacolo–Gwebu, Kabuyaya and Chimbari (2019) had identified dearth of knowledge in the same areas.

Knowledge plays a critical influence towards attitudes which in turn affects behavior. In a study conducted by Sacolo–Gwebu, Kabuyaya and Chimbari (2019) it was reported that participants believed STH was not a major problem. Furthermore, Maseko et al. (2014) reported that very few children agreed that it is important to take deworming drugs and that clearly shows their negative attitudes towards deworming. Additionally, approaches used to dispense de-worming tablets can either be accepted or not. A study by Lukose, Margaret, Nayak (2014) which determined perceptions on the community-directed treatment (ComDT) and school-based approaches among school-age children reported that parents expressed satisfaction for both approaches. Maseko et al. (2018) reported a differing view that very few children agreed that it was important to take de-worming tablets in schools. Furthermore, the authors noted that some children did not agree to take tablets dispensed by teachers. This indicates that children were not comfortable to receive drugs from teachers. A similar attitude was observed among parents who were skeptical that teachers should dispense deworming tablets suggesting that they were not in a position to manage side effects (Parikh et al., 2013).

METHODOLOGY

The study followed a quantitative descriptive design among school going age children aged 10 – 14 years in one of the primary schools in the Manzini region. This population was chosen because they are very active, they play with the soil, go for swimming in dams and rivers thus increasing their infestation rates; hence, the prevalence of worm infestations is high in this age group. Random sampling was used in this study since it provides a sample that is representative of a population. Using Rao-soft calculator with a confidence interval of 95% and a margin error of 5% the sample size was 169. However, because of time and resource constraints 50 participants were accessed.

Data was collected using a structured questionnaire that was adapted from a previously (Cvjetkovic, Jeremic & Tiosavljevic, 2017) used questionnaire. In addition, short-questions were used to promote efficacy since the study was focusing on children. Validity and reliability were ensured by using an instrument which has been used in other studies. The questionnaire specifically addressed the chosen objectives of the study which were related to knowledge and attitudes of school going age children towards deworming.

With regards to reliability internal consistency was high with Cronbach's alpha of 0.90. Furthermore, pre-testing was done in another school with similar characteristics to that of the main study to ensure reliability. On another note, the same tool for data collection was used on all participants in the same language with one person conducting the interviews in order to maintain consistency. Immediately after the data was collected, the researcher checked all the filled questionnaires and data was stored in a locked cupboard then computer based data was protected by password where only the researcher and the supervisor had access to the data. The data was entered into SPSS version 20 and analysed using descriptive statistics.

Permission to conduct a study was sought and obtained from the National Health Review and Research Board (NHRRB) through the University of Eswatini – Faculty of Health Sciences Students' Ethics Committee. Those who were eligible assented to participate in the study were included. Also, consent forms were signed by the children's parents. All ethical principles were observed including beneficence, justice, and respect for persons.

FINDINGS AND DISCUSSIONS

Table 1: *The socio-demographic characteristics of the participants (N=50)*

Variable		N / Mean	%/ SD
Age (years)	10-12	28	56
	13-14	22	44
		12	1
Gender	Male	25	50
	Female	25	50
Nationality	Swazi	49	98
	Other	1	2
Educational Grade	4-5	22	44
	6-7	28	56
Religion	Christianity	46	92
	Islam	3	6
	Judaism	1	2

Age: A total of 50 aged between 10 to 14 years participated in the study. Most (56%, n=28) participants were aged between 10 – 12 years, and 44% (n=22) were aged between 13-14 years. The mean age of the participants was 12 years with a standard deviation of 1 year.

Gender: Half (50%, n=25) of the participants were males and the other half (50%, n=25) were females.

Nationality: A majority, (98%, n=49) of the participants were Swazi citizens and only 2% (n=1) were non-Swazi citizen and reported to be from Mozambique.

Educational status: Most of the participants (56%, n=28) were at the upper grades of primary school which is between grade 6-7. Only 44% (n=22) were between grade 4-5.

Religion: A majority of the participants (92%, n=46) were Christians, only 6% (n=3) were Muslim and the least (2%, n=1) were from the Judaism religion.

Objective 1: To determine the knowledge related to deworming among school going children in one of the primary schools in the Manzini region of Eswatini

Table 2: Knowledge of participants on de-worming (N = 50)

Variable		N	%
Ever heard about de-worming	Yes	49	98
	No	1	2

Most (98%, n=49) participants had heard about de-worming and only 2% (n=1) reported to have never heard about de-worming.

Source of information about de-worming

Thirty-eight percent (38%, n=19) heard from the clinic, 20% (n=10) from school teachers, 14% (n=7) from media, and 12%, (n=6) heard about de-worming from school health nurses. In addition, 10%, (n=5) heard from home and only 3%, (n=3) reported that they heard about de-worming from other sources.

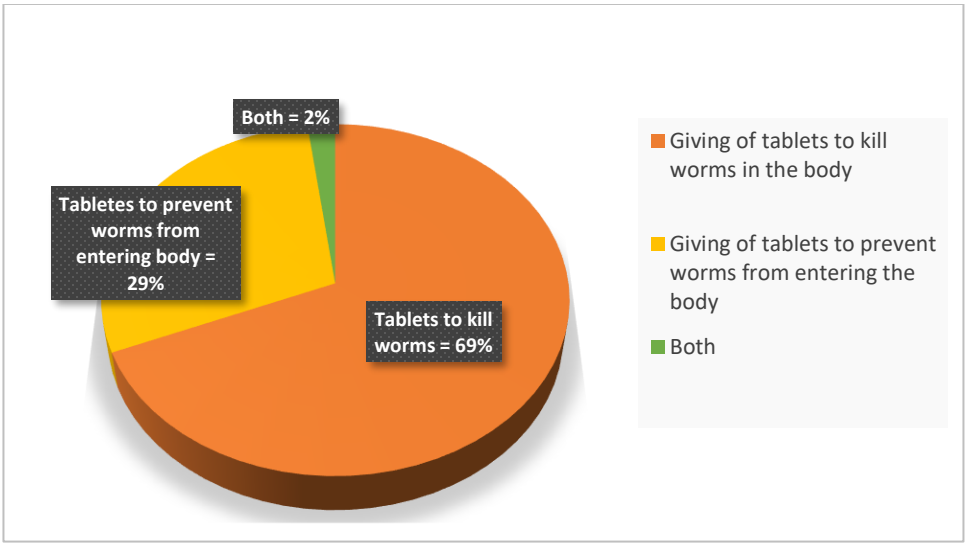

Figure 1: Participants' responses on what they understood by de-worming (n=50).

A majority of the participants (69%, n=33) reported that de-worming was the taking of tablets to kill worms in the body. Twenty-nine percent (29%, n=14) reported that they understand de-worming as consumption of tablets to prevent worms from entering the body. Only 2% (n=1) reported that de-worming was both taking tablets to kill worms in the body and to prevent worms from entering the body.

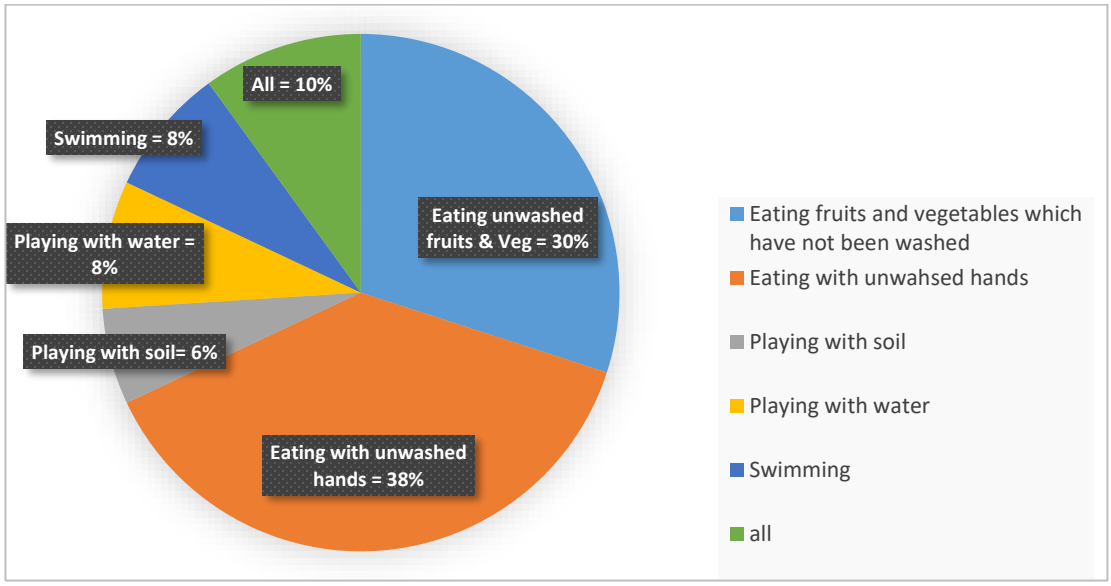

Figure 2: Ways by which someone can acquire intestinal worms (N = 50)

A majority of the participants (38%, n=19) reported that eating with unwashed hands can lead to acquiring intestinal worms. However, 30% (n=15) of the participants reported that it could be due to the eating of fruits and vegetables that have not been washed. Only 8% (n=4) of the participants reported that one can acquire intestinal worms through playing with water and another 8% (n=4) reported that it can be through swimming. In addition, 6% (n=3) reported that it could be acquired by playing with soil. Lastly, 10% (n=5) reported that all of the different ways mentioned above can lead to someone acquiring intestinal worms.

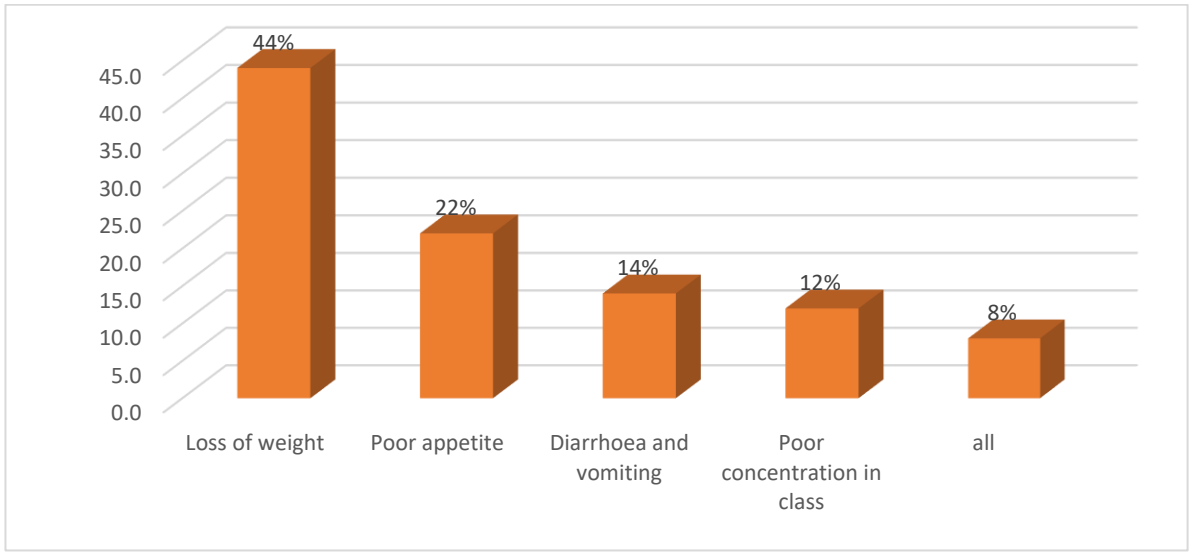

Figure 3: Participants responses on signs and symptoms of worm infestation (N = 50)

Figure 3 above shows a summary of responses on signs and symptoms of worm infestation on an individual, specifically school children. Most participants (44%, n=22) reported that loss of weight was a sign of worm infestation. Moreover, 22% (n=11) reported that poor appetite was also another sign of worm infestation. A further 14% (n=7) reported that diarrhea and vomiting were signs of worm infestation. Also, 12% (n=6) reported that poor concentration in class was a symptom of worm infestation, and lastly 8% (n=4) reported that all the signs and symptoms were expected on someone with worm infestation.

Benefits of de-worming

With regards to benefits of de-worming, 62% (n=31) of the participants reported that de-worming helped to kill the worms in the body and made one healthy. Thirty-four percent (n=17) of the participants reported that de-worming helped in protecting the body from being infected by worms. Only 4% (n=2) of the participants reported that both statements allude to benefits of de-worming.

Prevention of worms

A proportion of 44% (n=22) cited both washing of hands with soap and water before eating as well as washing of fruits and vegetables in running water before eating them were preventive measures. However, 14% (n=7) reported that de-worming was a preventive measure for worms' infestation.

2. Objective 2: To assess the attitude of the school going children towards de-worming in one of the primary schools in the Manzini region of Eswatini.

Above half (52%, n=26) of the participants reported that the de-worming programmes were effective in the country including the school de-worming campaign. On the other hand, 48% (n=24) of the participants reported that de-worming programmes are not effective. A majority of the participants (64%, n=32) reported that they would encourage someone or the next person to de-worm. About 36% (n=18) of the participants reported that they would not encourage someone else to de-worm.

In addition, participants were asked if teachers were suitable to give de-worming tablets to pupils. Most (56%,n=28) of the participants reported that teachers were not suitable to administer de-worming tablets to pupils due to different reasons. The remaining 44% (n=22) of participants reported that teachers were suitable to dispense the de-worming tablets to pupils.

Socio-demographic Variables

There were only two (2) age groups in the study and the researcher focused more on those at risk of worm infestation. Most of the participants were aged between 10 to 12 years, and others between 13 to 14 years. The findings are supported by several studies which reported that children are commonly admitted to hospitals due to worm infestations emergencies, mostly aged between 11 to 14 years (WHO, 2016).

Knowledge about de-worming

Soil Transmitted Helminthices Infections (STHs) prevention and control rest on comprehensive knowledge about the diseases. This study has shown that a large number of the participants had heard about deworming, which is consistent with other studies. Njomo et al. (2016) reported that to a large extent participants had adequate level of knowledge of STHIs

etiology, signs and symptoms, treatment as well as preventive methods. The participants were sampled on the upper grades (grade 4 to grade 7) and they showed moderate knowledge about de-worming and soil transmitted helminthes. To support this observation, Stanley, Oreh and Johnson-Ajinwo (2013) revealed that there was an association between level of education and knowledge of deworming. It was reported that knowledge of de-worming was poorest amongst the people with no formal education and gradually increased with the level of education. Therefore, this concludes that level of knowledge on de-worming increases with increasing level of education.

The most common means of information dissemination in this study were health care workers (nurses) in the clinic followed by school teachers. This highlights the important role played by health care workers and school teachers in disseminating information about de-worming in children. This is contrary with a study conducted by Maseko et al. (2018) in Eswatini which indicated that schools were a main source of information about de-worming and schistosomiasis infections. Knowledge on symptoms of soil transmitted infections was moderate. Most participants (nearly half) knew at least one of the major signs and symptoms of worm infestation. The most common symptom of worm infestation that the participants knew was loss of body weight followed by poor appetite. In contrast, Masaku et al (2017) in their study reported that a large number of participants perceived that ring worms (fungal infection) were symptoms of STHs infestation. This could be attributed to the fact that the participants in Masaku et al. (2017) also had a very low knowledge of general information on de-worming and soil transmitted helminthics.

Concerning knowledge on the modes of transmission or ways in which someone can acquire intestinal worms, a majority of the participants were not aware of the major modes of transmission such as playing with the soil bare footed, hands and playing in water or swimming in dirty water. This is in line with Ouédraogo et al. (2022); Senghor et al. (2014) who reported that a vast number of children showed insufficient knowledge on transmission modes of STHs. On the contrary, a study by Acka et al. (2010) reported that participants demonstrated understanding of transmission of STH infections. The conflicting view may serve as a basis for further investigations about knowledge related to modes of transmission of STHs among children. More importantly, the participants were not aware that de-worming was a preventive measure for worms. The findings concur with results from a study by Acka et al. (2010) which reported that school age children had knowledge deficit on prevention and control of parasitic infections.

Attitude towards de-worming

This study also looked at the respondents' attitudes on de-worming. Attitudes play an important role in affecting behavior. More than half of the participants reported that de-worming programmes were really effective and they should continue. However, Sacolo–Gwebu et al. (2019) reported differing findings, stating that participants believed STH was not a major problem. On another note, a majority of the participants reported that given the opportunity, they would encourage others to deworm as they knew that STHIs makes one sick and de-worming would prevent that from occurring by killing the worms in the body. In a study by Lukose et al. (2014), it was reported that community-directed treatment (ComDT) and school-based approaches for the control of soil-transmitted helminthic infections among school-age children were well received and was successfully implemented in the schools and villages. This shows that the de-worming programme was well accepted and the children expressed satisfaction.

However, a majority of the participants reported that teachers were not suitable to dispense the de-worming tablets to pupils as they were not knowledgeable about them; hence, they were most likely to fail to manage side effects if occurred. This is supported by Maseko et al (2018) who reported that very few children agreed that it was important to take de-worming tablets in schools. The same authors added that, some children even refused to take them when given by their teachers. This suggests that the pupils had negative attitudes towards the people administering the drugs (teachers). However, this appeared as if they had negative attitudes towards the entire de-worming programme. Furthermore, parents were skeptical that teachers should administer deworming tablets citing that they may not be able to manage side effects (Parikh et al., 2013).

IMPLICATIONS

1. School children have the knowledge on de-worming but do not know much about the modes of transmission and they easily get infected by soil transmitted helminthes.

2. School children have a positive attitude towards de-worming but are discouraged to deworm due to the way de-worming programmes are implemented. They have a negative attitude towards teachers administering the de-worming tablets because they feel that teachers are not knowledgeable about the drugs and they were most likely to fail to manage side effects if they occurred.

RECOMMENDATIONS

With reference to the study's findings, the following recommendations were made regarding nursing education, practice, management and research:

Nursing Education: De-worming should be strengthened in the nursing curriculum so that graduates from the programme can be competent in the education of children about de-worming to enrich pupils with knowledge on deworming thus eliminate negative attitudes.

Nursing Practice: The Ministry of Health School Health Programme has to formulate effective strategies for de-worming in areas of persistently high soil transmitted helminthic rates. Nurses trained on de-worming should be responsible for administering the de-worming tablets to the pupils instead of involving teachers. Given that the participants revealed limited knowledge on causes, signs and symptoms and mode of transmission, there is need to implement effective educational interventions.

Nursing Management: Management should develop effective de-worming campaigns that are children friendly to optimize knowledge and deter negative attitudes.

Nursing Research: Since this study was done in an urban setting, it needs to be replicated in rural settings, to find out about knowledge and attitudes of children from rural schools in relation to de-worming and be compared to results in urban areas.

CONCLUSION

The participants showed a moderate level of knowledge on deworming. Very few acknowledged that de-worming was a preventive measure for worm infestation. The discrepancy could be attributed to the fact that there is limited contact with healthcare providers and overreliance on teachers with little guidance. Also, the participants had insufficient knowledge on signs and symptoms of soil transmitted helminthic infections. Furthermore, most participants had inadequate information or knowledge on the modes of transmission of intestinal worms. They were not aware of the major modes of transmission. The respondents' attitude was fairly positive. More than half of the participants reported that de-worming programmes were really effective and can recommend the programme to their peers. However, a majority of the participants had a negative attitude towards teachers administering the de-worming tablets.

LIMITATION

The study cannot be generalized to the whole population because the sample size was small; however, it gives insight on the knowledge and attitudes of school going children regarding de-worming.

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