

East African Medical Journal Vol. 90 No. 12 December 2013

COMMUNITY KNOWLEDGE AND PERCEPTIONS ON NATIONAL SCHOOL-BASED DE-WORMING PROGRAMME
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COMMUNITY KNOWLEDGE AND PERCEPTIONS ON NATIONAL SCHOOL-BASED DE-WORMING PROGRAMME

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ABSTRACT

Objectives: To determine the community level of knowledge, attitude and perception of soil transmitted helminthes and the national school-based de-worming programme in selected villages of Busia County in Kenya.

Design: A cross-sectional survey.

Setting: Busia and Bunyala districts in Busia County.

Subjects: A total of 384 participants were studied.

Main outcome measures: Socio-demographic characteristics, then knowledge, causes and effects of Soil Transmitted Infections on health and education, prevention strategies, knowledge of national school-based de-worming programming, implementing strategies of the programme, benefits of the programme, community satisfaction and health seeking behaviour.

Results: Eating the uncooked food as a cause for soil transmitted infections constituted 27.16% (63) followed by 16.38% (38) not using latrines, 15.95% (37) eating left over foods, 12.93% (30) eating cold food, 10.78% (25) eating not well cooked pork, 9.48% (22) eating contaminated soil, and 7.33% (17) changing of diet. One head teacher interviewed stated that "One can be able to notice if his/her child has worm infection if the child eats without getting satisfied, eating all the time and yet his belly is big." Community Health Extension Worker in the FGD stated that: "During floods seasons most of the areas in Budalangi become flooded and all latrines are filled with water and the excreta start overflowing. Most of the residents don't have shoes especially the children and therefore they are prone to the worm infection." 99.57% of the parents were aware of the national school based de-worming programme of which (92%) learnt about the programme after their children were de-wormed in their various schools. Seventy five percent (174) were satisfied about the programme; 65.1% (151) and 10.3% indicated that the programme improves the children's health and student's school performance respectively.

Conclusion: Most of the parents do not have adequate knowledge on worms, their causes and signs and symptoms of the intestinal worms. Low educational levels and poverty levels also contribute to the lack of awareness on intestinal worms and putting the prevention measures across the board. The study also found out that the community perception towards the de-worming programme was good because the de-worming programme improved the children's health and performance in education.

INTRODUCTION

Soil-transmitted helminth (STH) infections are most prevalent in the poorest communities of the developing world including almost all countries of the sub-Saharan Africa (1). These infections constitute

a universal burden which does not only depend on regional ecological condition but also on local standard of social and economic development of the people (2). Their occurrence is associated with socio-economic, environmental and other factors like ignorance of simple health promoting factors and

overcrowding, limited access to clean water, tropical climate and low altitude (3). Current research indicate that an estimated two billion individuals globally are at risk of STH infections and the global estimate of number of cases of *A. lumbricoideis* 807 million, *T. Trichiura* 604 million and Hookworm (*N. americanus*; *A. duodenale*) 576 million (1,3-4). *Strongyloides stercoralis* is also a common STH in some of these regions, although detailed information on the prevalence of strongyloidiasis is lacking because of the difficulties in diagnosing human infection (5). STH infections affect mostly children in developing countries and are associated with poor growth, reduced physical activity and impaired learning ability (6-10).

Improvements have been made to reduce helminth transmission in many parts of the world (11), but worm infections continue to be an issue of major public health and socio-economic concern. In 2001, a resolution was passed during the 54th World Health Assembly (WHA) with the target (for member states) to regularly administer anthelmintic drugs to at least 75% and up to 100% of all school-aged children at risk of morbidity due to schistosomiasis and soil-transmitted helminthiasis by 2010 (12). Since then, millions of school-aged children have received anthelmintic drugs (albendazole or mebendazole against soil-transmitted helminthiasis and praziquantel against schistosomiasis) (13-15). Comparatively little emphasis has been put on improving access to clean water and adequate sanitation as well as changing hygiene behaviour, although these interventions represent an effective way for preventing intestinal parasitic infections, and are key factors for sustainable control (15-18).

The Kenya National school de-worming programme which is the most cost-effective public health strategies was initiated in 2009 to reduce morbidity by decreasing the worm burden and as a result improve the child health and development. The programme has been backed by the Government, bilateral donors and the local communities as one that can change the health status of the school children. Recent studies support that both individual and community perceptions and attitudes of parasitic worm infections and their prevention and treatment are important factors (19-21) in reducing the prevalence of the infection. However, sustainability and ownership of the programme remains an issue in areas where the children are receiving mass drug treatment (22). Understanding the attitude and perception of the school de-worming programme by the community will not only assist in future planning but also help to explain the issue of sustainability (22). Therefore this study was undertaken to determine the awareness of the community about the major health problems of soil transmitted helminths infections among school children and evaluation of the community's perception of the national school-

based deworming programme in Busia County.

MATERIALS AND METHODS

The study was carried out in Busia County, western Kenya which covers an area of 1,695 Km² with an average temperature of 22°C and the rainfall amount ranging between 750 mm and 1,800 mm per annum. The total population was 743,946 (Male-48%, Female-52%) with a population density of 439 people per Km² (23). There are 420 primary schools number of primary schools in the county, with a population of 220,101 pupils. Busia and Budalangi districts of Busia County were purposively selected for the study since it was among the counties receiving the deworming programmes and had an overall prevalence of geo-helminth species greater than 50% among school children aged eight to twenty years (24). The majority of the communities living belong to the Iteso, Luhya and the Luo tribe whose major economic activities are trade, agriculture and fishing. Sugarcane, tobacco and cotton are the main crops grown. Lake Victoria provides for a fishing hub in the flood prone Budalangi area.

The study design was a cross-sectional descriptive and utilised both quantitative and qualitative methods for data collection. A total of 384 study participants were randomly selected from the two districts in Busia County. Budalangi district is prone to flooding during rainy seasons. The study participants were the community members comprising of parents, teachers, opinion leaders and Community Health Extension Workers'. The participants in the two districts were selected to determine the community knowledge and perception of the national school-based de-worming programme in the Busia County. Participants were recruited randomly from the stated study locations and within the selected schools. Divisional heads, head teachers and health teachers were recruited purposively because they took part in the training, supervision, administration of de-worming drugs.

A semi-structured questionnaire was administered to parents, key-informant interview guides were administered to head teachers, school health teachers, divisional heads and chiefs and focused group guides were used on the Parents Teachers Association (PTA) members and Community Health Extension Workers (CHEWs). Semi-structured schedule was translated into Kiswahili and pretested in Bungoma district which is neighbouring the County before being administered to 232 parents randomly selected within the selected schools in the study area. Through the conduct of the questionnaire socio-demographic factors, knowledge of STH, causes, signs and symptoms, consequences and their prevention measures and knowledge and perception about school-based de-worming programme was obtained. Interview guides were administered to

32 (eight divisional heads, eight chiefs, eight head teachers and eight health teachers) opinion leaders who were purposively selected to represent each location and each school selected in the study. A total of ten focus group discussions: eight with Parents Teachers Association members selected purposively to represent each school selected and two with Community Health Extension Workers who were selected purposively to represent each district to obtain in-depth information about the community's knowledge and perception of intestinal worms and de-worming programme. FGDs were conducted in Kiswahili. Discussion topics and themes included in the Focus Group Discussions were perceptions of the Soil Transmitted Helminths among school children; prevention and treatment; knowledge and perceptions of school-based deworming programme; opinions on school based deworming programme; opinions on other methods of reducing burden of worms in school children and the future sustainability of the programme in the community.

Scientific approval and ethical clearance were sought from the KEMRI Scientific Steering Committee (SSC Number-2384) and KEMRI Ethical Review Committee respectively. Administrative clearance was sought from the division health and education authorities and chiefs.

There were no direct benefits given to the participants since the study had no major risks

involved apart from the inconveniences caused by taking part in the study. However, the results of this study will be communicated back to the health facility for necessary action by the health authority and to KEMRI who will also take action depending on the outcome. Emphasis on issues of confidentiality and privacy were made clear at the time of consenting to participate in the study. Data and information collected from the study were protected and was only accessed by the Principal investigator; participants in the study were kept anonymous; only being identified only by specific numbers assigned in order to maintain confidentiality and privacy. The purpose of study was made clear to all the participants who gave informed consent prior to their voluntary participation in the study. Verbal and written informed consent was sought from all participants who took part in the in the FGDs and IDIs, respectively, and for the interview to be recorded. Digital recordings of interviews and transcripts were stored in password-protected computers accessible only by the principal investigator. All the names of participants and places were removed from the transcripts and replaced by unique identifiers. Quantitative data was analysed using SPSS Version 20 where frequencies, descriptive, cross tabs and multiple responses were conducted. Qualitative data was analysed using the grounded theory where coding was done and the responses put in categories.

RESULTS

Table 1
Respondents socio-demographic factors per the school

		Busia District				Budalangi district			
		Sibembe primary	Butula boys primary	Mundika girls primary	Mundulusia primary	Bukoma primary	Mukhobola primary	Ruambwa primary	Sisenye primary
Age of the respondent	Mean	32.78	39.73	33.00	33.84	36.10	32.95	34.53	35.42
	Standard deviation	7.417	11.298	8.288	8.434	9.455	8.932	7.379	9.483
	Total	32	30	24	19	30	39	32	26
Number of family members	Mean	6.47	6.80	5.79	6.00	7.03	6.51	6.69	6.85
	Standard deviation	1.967	2.034	1.933	1.915	1.629	2.553	2.101	2.257
	Total	32	30	24	19	30	39	32	26

Table 2
Gender associated with Knowledge of intestinal worms

		Male	Female	Total	Fishers exact test
Do you know of	No	0 (0.0%)	14 (9.2%)	14 (6.0%)	0.003
	Yes	80 (100%)	138 (90.8%)	218 (94.0%)	

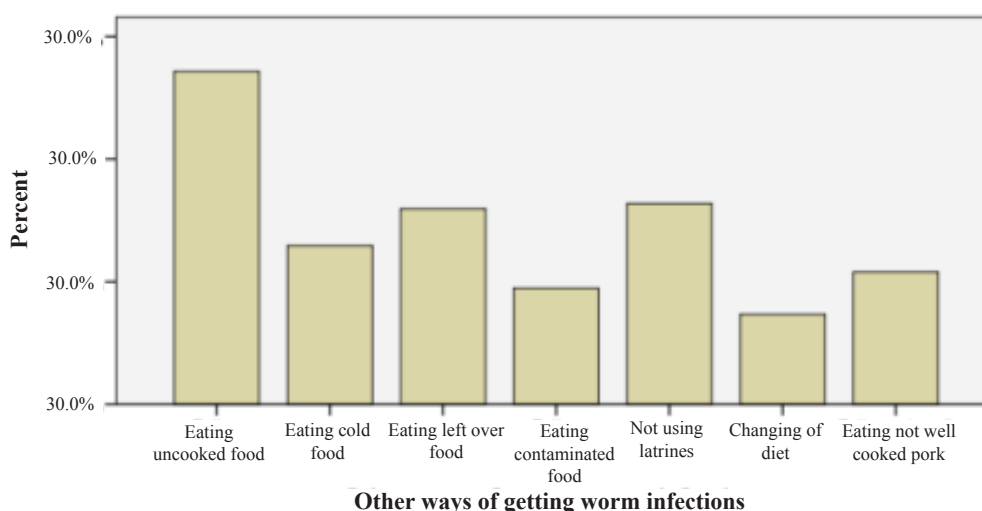
From the above (Table 2), it is evident that the 100% of males have the knowledge of intestinal worms as compared to 90.8% of the females. Accordingly, 94% of the respondents have the knowledge of intestinal worms.

Table 3
Level of education associated with knowledge of intestinal worms

		None	Primary	Secondary	Post-secondary	Total	Pearson chi-square
Do you know of intestinal worms?	No	6 (35.3%)	8 (7.4%)	0 (0.0%)	0 (0.0%)	14 (6.0%)	0.000
	Yes	11(64.7%)	100 (92.6%)	77 (100%)	30 (100%)	218 (94.0%)	

Knowledge of intestinal worms increases with the increase in the level of education as indicated by table 3 above. It is evident that all the respondents who have achieved secondary and post-secondary education have the knowledge of intestinal worms as compared to those who did not attend any school at 64.7%.

Figure 1
Ways of getting worm infections



Eating uncooked food, eating leftover food, not using latrines are some of the ways which contribute to one getting worm infections. This is indicated in the Figure 1 above.

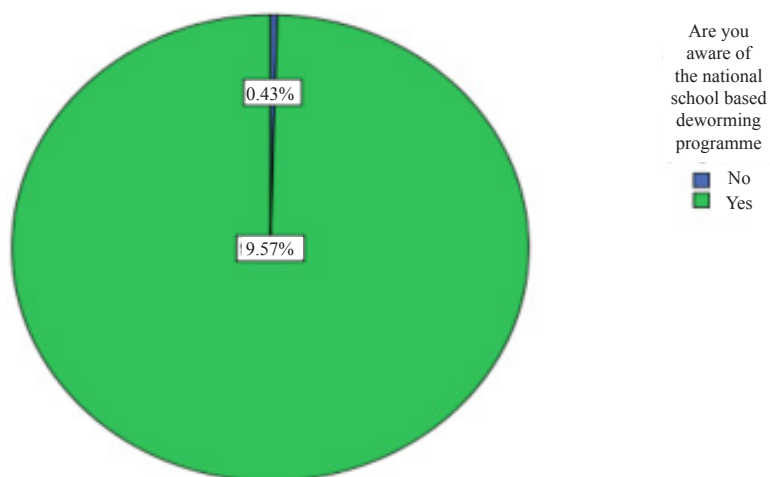
One of the interesting answers came from the interview where by one head teacher stated that: "One can be able to notice if his/her child has worm infection if the child eats without getting satisfied, eating all the time and yet his belly is big."

Furthermore, 6 FGDs conducted in Budalangi

district the participants indicated that walking barefoot is one of major cause of worm infection especially during floods. One female Community Health Extension Worker stated that:

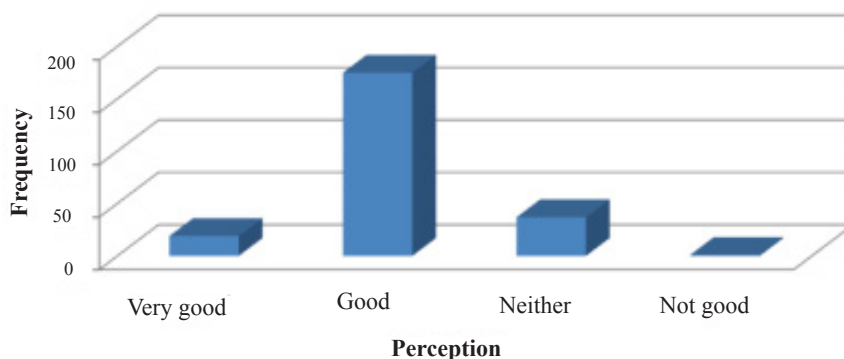
"During floods seasons most of the areas in Budalangi become flooded and all latrines are filled with water and they excreta start overflowing. At this time everyone is trying to move to the upper ground and most of the residents don't have shoes especially the children and therefore they are prone to the worm infection."

Figure 2
Awareness of the de-worming programme



From the above Pie chart, 99.57% of the respondents were aware of the national school based deworming programme.

Figure 3
Perception of the community on national school based deworming programme



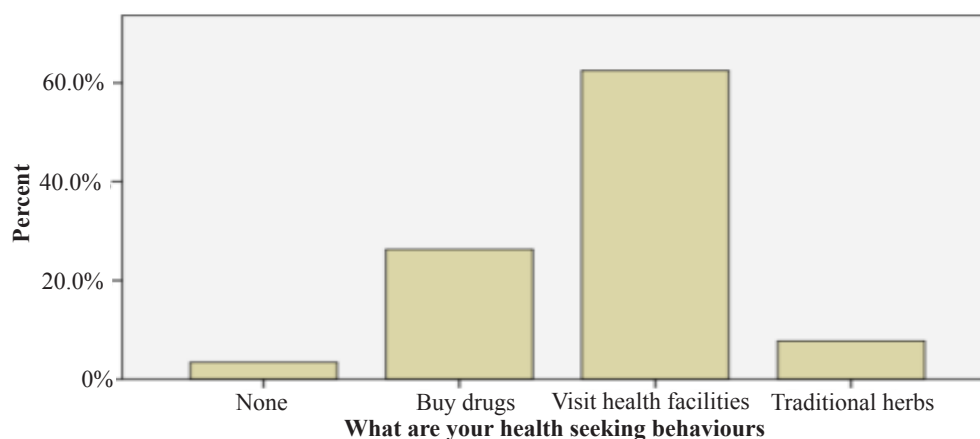
Most of the respondents indicated that the national school based deworming programme is good and only a few indicated that they can't really tell if the programme is good or not.

Table 4
Satisfied with deworming programme

		Frequency	Valid Percent
Satisfaction on national school based deworming	Dissatisfied	3	1.3
	Neutral	35	15.1
	Satisfied	174	75.0
	Very Satisfied	20	8.6
	Total	232	100.0

75% of the respondents indicated that they are satisfied with the implementation of the deworming programme in their respective schools and only 1.3% indicated that they are dissatisfied with the deworming programme.

Figure 4
Health seeking behaviour



The health seeking behaviour of the respondents is good since 60% of the respondents seek health care from the neighboring health facilities. 24% of the respondents buy drugs from the respective chemists.

Table 5
Benefits of school based de-worming program

		Frequency	Valid Percent
Benefits of de-worming programme	There is no benefit	23	9.9%
	Children's health has improved	151	65.1%
	The performance is improving	24	10.3%
	Children are eating and get satisfied	11	4.7%
	Reduced expenditure in terms of buying drugs	23	9.9%
	Total	232	100.0%

Improvement of the child's health (65.1%), followed by improvement in performance in schools (10.3%) are some of the benefits of the school-based de-worming programme. Other benefits include reduction in expenditure and children getting satisfied while eating.

DISCUSSION

This study revealed the community attitude and perception of the soil transmitted helminth and national school-based de-worming programme in Busia County. It is evident from the study that the knowledge of worms varies among the parents in the County. Most of the respondents have attained primary and secondary school education. Most of them have the knowledge of the soil transmitted helminths and a few who do not have the knowledge have not attained any educational qualifications.

Most parents were not able to identify the real causes of the soil transmitted helminths and their effects on the children's health and education. 27.16% (63) indicated that eating uncooked food causes soil transmitted infections, 16.38% (38) not using latrines, 15.95% (37) eating left over foods, 12.93% (30) eating

cold food, 10.78% (25) eating not well cooked pork, 9.48% (22) eating contaminated soil, and 7.33% (17) changing of diet. The study found an interesting answer from the interview whereby one head teacher stated that:

"One can be able to notice if his/her child has worm infection if the child eats without getting satisfied, eating all the time and yet his belly is big."

Walking barefoot is one of major cause of worm infection especially during floods. One female Community Health Extension Worker in FGD stated that:

"During floods seasons most of the areas in Budalangi become flooded and all latrines are filled with water and they excreta start overflowing. Most of the residents don't have shoes especially the children and therefore they are prone to the worm infection."

The above finding is not supported by WHO (2002) that highlighted that intestinal worms are caused by the ingestion of infective eggs or larvae on contaminated foods and/or hands and through penetration of the skin by infective larvae.

The study also indicated that 99.57% of the parents were aware of the national school based deworming program. Most of them (92%) learnt

about the programme only after the children were de-wormed in their various schools. However most of the parents reacted positively to the programme and most of them said they were satisfied about the programme, 75% (174), 8.6% (20) highlighted that they were very satisfied and they wish the programme would continue for a period of time. The parents also indicated that the programme has a lot of the benefits ranging from improving the children's health, 65.1% (151), to improvement in student's school performance 10.3% (24). Only 9.9% (23) of the respondents indicated that there is no benefit of the national school-based de-worming programme. Brooker *et al.*, (22) stated the de-worming programmes are very important in reducing worm-burden; improve their health status and their educational performance. These sentiments were also highlighted by WHO (25) where they indicated that the school-based de-worming programme was effective if it was implemented successfully and the programme objectives are met.

Ninety eight percent of teachers indicated that they are satisfied with the programme and the way implementation of the programme was conducted since they were involved from the start of the programme, training programmes and direct implementation of the programme through the administration of the de-worming tablets to the children. This study agrees with the findings of the WHO (25), where it indicated that the success of the de-worming programmes depends on how the teachers are going to receive it and accept the programme. Therefore implementation of the programme significantly depends on teachers who play a major role in supervision, monitoring and actual administration of the de-worming tablets to the students. A few teachers indicated that the challenges which they encountered during the implementation of the programme were parents' resistance, culture and traditions and some of the children declining to take the de-worming drugs.

Although most of the parents showed the interest in supporting the programme by their children to participate in the programme, they indicated that their role was overlooked since they were not involved in the implementation of the programme. They noted that for sustainability of the program, it is important that they are considered so that they have the knowledge about the programme prior to the deworming exercise rather than being informed by their children after the exercise.

In conclusion, most of the parents do not have adequate knowledge on worms, their causes and signs and symptoms of the intestinal worms. Low educational levels and poverty levels also contribute to the lack of awareness on intestinal worms and putting the prevention measures across the board. The

study also found out that the community perception towards the de-worming programme was good. This is because the de-worming programme improved the children's health and hence improving their performance in education.

RECOMMENDATION

We therefore recommend that more has to be done in terms of education since most of the parents have ignored the simple prevention measures like wearing of shoes especially in Budalangi district which is prone to flooding and therefore the prevalence is high. Active participation of all the stakeholders including the parents is also important to make the de-worming programme a success.

ACKNOWLEDGEMENT

The authors appreciate Prof. John Henry Ouma (ITROMID) and Dr. Charles Mwandawiro (KEMRI) of national school based deworming programme for their support in terms of logistics in the field while carrying out the study. I also thank National Council of Science and Technology for funding my project work. The members of the study communities are also thanked for their participation in the study.

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