Effect of Health Education through Community Leaders on Increased Knowledge of Households regarding Malaria Control, Treatment and Prevention in Intervention and Control Villages of new Halfa Locality-Kassala State (2017-2020)

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Abstract

Malaria vector control in Sudan has a long history. The primary vector control interventions are IRS in targeted areas with irrigation schemes, use of LLINs, LSM, and space spraying during an emergency. The present study aimed to assess the effect of Health Education through Community leaders on increased knowledge of Households Regarding malaria control, treatment and prevention in intervention and control villages of New Halfa Locality-Kassala State (2017-2020). Randomized community trials (Controlled intervention study) in New Halfa locality among two communities were randomly assigned to the intervention group which receive health education messages regarding the use of LLINs and control group where there is no health education. A standard Questionnaire was used to collect data from the head of household at each village. The information collected should include the owner and using LLINs, distributed to household. The observation the conditions of LLINs. This Questionnaire was done with committee for integrated vector management - Federal Ministry of Health and WHO. There were association between education level and overall mean knowledge of respondents about mosquito breeding sites, malaria control, uncomplicated malaria symptoms, severe malaria symptoms, and uncomplicated malaria treatment, severe malaria treatment, and fever treatment, $p < 0.05$. However, the overall mean knowledge was significantly more significant among those who have University education were compared to other level of education, $p < 0.05$. An increase knowledge scores was observed when pre- and post-test scores on malaria prevention and control were compared. Health education packages.i.e., mass media messages during Bed nets campaigns and the role of community leaders on malaria, was found to have improved knowledge of malaria prevention and control among the studied community.

Keywords

Health education, LLINs, New Halfa, Kassala State.

INTRODUCTION

Malaria remains a horrendous disease constituting a global burden. Malaria was responsible for been estimated 219 million cases and 435 000 deaths globally (WHO, 2018). Malaria is a priority health problem in Sudan. It has been estimated that approximately all of the Sudan population were considered to be at risk of malaria with the low– moderate transmission. The transmission is relatively high in some states (South Darfur, West Darfur, Central Darfur, East Darfur, South Kordofan, West Kordofan, Blue Nile, and Gadarif), as the same time there are some states with very low transmission (Khartoum, Red Sea, River Nile and Northern states) and susceptibility to epidemics following heavy rains or floods from River Nile or its tributaries (FMoH, 2014).

The 2012 malaria indicator survey (showed a malaria parasite prevalence of 3.3%, down from the 3.7% level recorded in the 2005 survey, but nearly double the level in 2009.The malaria parasite prevalence in MIS 2012 varies across the different states, in four states, it was < 1%, in twelve states between 1–10%, and one state reported a prevalence > 10%. Furthermore, the comparison of the MIS 2012 and 2009 demonstrates that, one states (Blue Nile) succeeded in reducing the malaria parasite prevalence significantly, two states (Gadarif and South Darfur) showed a significant rise, in 2009 and 2012 and the rates were negligible in Khartoum, River Nile, Northern and Red Sea states, which were below 5% (NMCP, 2012). The objective of this study was to assess the effect of Health Education through Community leaders on increased knowledge of Households Regarding malaria control, treatment and prevention in intervention and control villages of New Halfa Locality-Kassala State (2017-2020).

The objective of this study was to assess the effect of Health Education through Community leaders on increased knowledge of Households Regarding malaria control, treatment and prevention in intervention and control villages of New Halfa Locality-Kassala State (2017-2020). Overall knowledge about malaria control, treatment and prevention in intervention and control villages of New Halfa Locality. The overall knowledge of respondents about breeding sites was significantly high among intervention villages (2.4) compared to control villages (2.2) after health education intervention, $p< 0.05$. Furthermore, the overall mean knowledge about malaria control was increased among intervention villages from (1.9) vs. (2.1), (p=.049) in control villages.

In addition the overall mean knowledge of respondents regarding uncomplicated malaria symptoms from (2.5) vs. (2.7) (p=.000) , sever malaria symptoms from (.7) vs. (.9) (p=.000), uncomplicated malaria treatment (.8) vs. (.9), (p=.028), severe malaria treatment (.8) vs. (1.0), (p=.003) , fever treatment from 1.1 to 1.2, (p=.000) net washing (5.1) vs. (5.4), (p=.000) were more significant in intervention villages versus control village due to health education intervention during LLINs distribution campaigns in the targeted villages, $p< 0.05$. There were significant differences between overall mean knowledge in intervention and control villages regarding mosquito breeding sites (p=.001), malaria control (p=.049), uncomplicated malaria symptoms (p=.000), severe malaria symptoms (p=.000), uncomplicated malaria treatment (p=.028), severe malaria treatment (p=.003), fever treatment (p=.000) and net washing (p=.000).

MATERIALS AND METHODS

Study design

Randomized community trials (Controlled intervention study) in New Halfa locality among two communities were randomly assigned to intervention group which received health education messages regarding the use of LLINs and the control group where there is no health education. There are two groups one for intervention and the other served as control. The sample for LLINs was 50 households (H.H) from each village was taken.   The ten villages were divided to 2 group (intervention group and control group randomly), intervention group were delivered by health education intervention by assigned community leaders during the whole study period for one year and control group were left without any intervention.

Study area

New Halfa is located in the semi-arid belt of Sudan approximately 500 km east of Khartoum; it is located within the New Halfa irrigation scheme in Kassala State. The area is about 450 meters above sea level and has a population consisting of indigenous nomads and resettled Nubian immigrants from WadiHalfa in northern Sudan. Most villages are situated along the Atbara River, where cotton, wheat, sorghum and various vegetables are cultivated. Climatically, the area is classified as dry savannah with rainfall ranging between 300 to 411 mm per annum. The rainy season lasts from July to early October. Temperatures range between 16°C and 45°C. The principal malaria vector species *An. arabiensis* has shown resistance to DDT, and Malathion (Himeidan *et al*., 2004 and 2007).
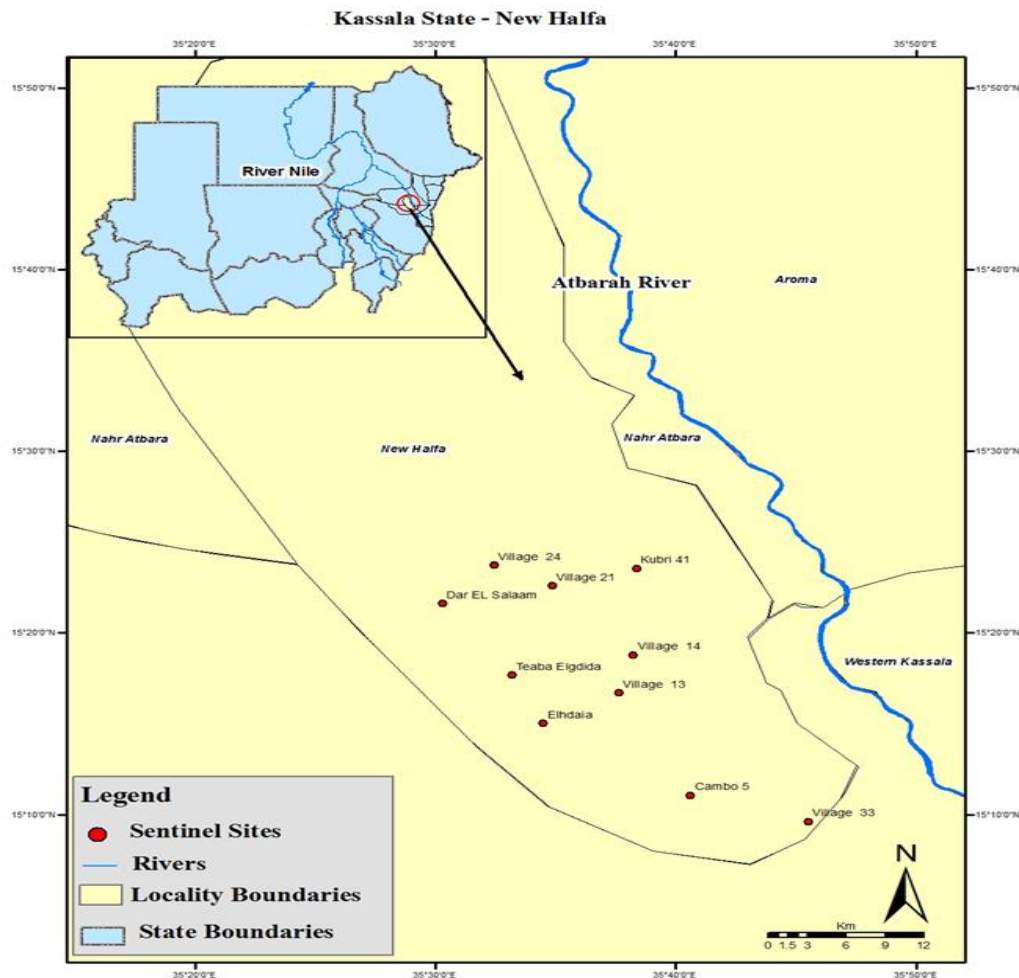

Fig.1: Map of the study area

Study population

The study population includes all households residing in Newhalfa locality.

Inclusion criteria

The inclusion criteria were all households who were agree to participate in the study.

Exclusion criteria

The exclusion criteria were all households who were not agree to participate in the study.

Sample size and sampling technique

There are two groups one for intervention and the other serving as control. Sample for LLINs 50 households (H.H) from each village. The ten villages were divided to 2 group (intervention group and control group randomly), intervention group were delivered by health education intervention by assigned community leaders during the whole study period that proposed to be one year and control group were leaved without any intervention. Each study village was separated from each other by buffer zone of minimum 5 km, for the purpose of baseline survey, med term survey(after 6 month) and post intervention survey after one year, 50 household were selected randomly from each village using Random Number Generator software from Google with total household of 250 for each study arm intervention arm and control arm with overall total of 500 household for each survey, the 50 households generated from Google random software were used to select household from already exit list of village household from New Halfa locality that prepared during LLINs distribution campaign, the selected household number generated from software were used for selection of household from registration list for each survey).

Data collection tools

Standard Questionnaire was used to collect data from the head of household at each village. The information collected should include the owner and using LLINs, distributed to household and observation of LLINs conditions. This Questionnaire was done with the committee for integrated vector management - Federal Ministry of Health and WHO.

Plan of data analysis

SPSS was used for data analysis. $\chi 2$ tests were used to assess association between categorical variable. Analysis of variance was used to test the difference between group of means for continues data. Confidence interval and P-value was reported for every summary measure interpreted taking significance level of P=0.05.

Ethical considerations

The research was obtaining ethical approval from research ethical committee of Gezira University and Ministry of Health.

RESULTS

Table 1 shows the distribution of overall knowledge about malaria control, treatment and prevention in intervention and control villages of New Halfa Locality. The overall knowledge of respondents about breeding sites was significantly high among intervention villages (2.4) compared to control villages (2.2) after health education intervention, p< 0.05. Furthermore, the overall mean knowledge about malaria control was increased among intervention villages from (1.9) vs. (2.1), (p=.049) in control villages. In addition the overall mean knowledge of respondents regarding uncomplicated malaria symptoms   from (2.5) vs. (2.7) (p=.000) , sever malaria symptoms from (.7) vs. (.9) (p=.000), uncomplicated malaria treatment (.8) vs. (.9), (p=.028), severe malaria treatment (.8) vs. (1.0), (p=.003) , fever treatment from 1.1 to 1.2, (p=.000)   net washing (5.1) vs. (5.4), (p=.000) was more significant in intervention villages versus control village due to health education intervention during LLINs distribution campaigns in the targeted villages, p< 0.05. There were significant differences between overall mean knowledge in intervention and control villages regarding mosquito breeding sites (p=.001), malaria control (p=.049), uncomplicated malaria symptoms (p=.000), severe malaria symptoms (p=.000), uncomplicated malaria treatment (p=.028), severe malaria treatment (p=.003), fever treatment (p=.000) and net washing (p=.000).

Table 2 explains an association between overall mean knowledge about malaria control, treatment and prevention and education level in intervention and control villages of New Halfa Locality. There were association between education level and overall mean knowledge of respondents about mosquito

breeding sites, malaria control, uncomplicated malaria symptoms, severe malaria symptoms, and uncomplicated malaria treatment, severe malaria treatment, and fever treatment, p < 0.05. However, the overall mean knowledge was significantly greater among those who have an University education compared to another level of education, p< 0.05.

Overall knowledge		N	Mean	Standard Deviation	95% Confidence Interval for Mean		P-value
					Lower Bound	Upper Bound	
Breeding site	control	1758	2.2	1.7	2.2	2.3	.001**
	intervention	1825	2.4	1.8	2.3	2.5	
	Total	3583	2.3	1.8	2.3	2.4	
Malaria control	control	1758	1.9	1.24	1.9	2.0	.049**
	intervention	1825	2.1	1.4	2.0	2.1	
	Total	3583	2.0	1.3	1.9	2.1	
Uncomplicated malaria symptoms	control	1758	2.5	1.3	2.4	2.6	.000**
	intervention	1825	2.7	1.3	2.6	2.8	
	Total	3583	2.6	1.3	2.6	2.6	
Severe malaria symptoms	control	1758	.7	.9	.7	.8	.000**
	intervention	1825	.9	1.1	.8	.9	
	Total	3583	.8	1.0	.8	.9	
Uncomplicated malaria treatment	control	1758	.8	.4	.8	.8	.028**
	intervention	1825	.9	.4	.8	.9	
	Total	3583	.8	.4	.8	.9	
Severe malaria treatment	control	1758	.8	.5	.8	.8	.003**
	intervention	1825	1.0	.5	.8	.9	
	Total	3583	.8	.5	.8	.8	
Fever treatment	control	1758	1.1	.6	1.1	1.1	.000**
	intervention	1825	1.2	.7	1.2	1.3	
	Total	3583	1.2	.6	1.1	1.2	
Net washing	control	1755	5.1	1.8	4.9	5.1	.000**
	intervention	1823	5.4	1.7	5.3	5.5	
	Total	3578	5.2	1.7	5.2	5.3	

Table 1: Distribution of overall knowledge about malaria control, treatment and prevention in intervention and control villages of New Halfa Locality

**P-value significant at less than 0.05 levels

Education level	Breeding site	Malaria control	Uncomplicated malaria symptoms	Severe malaria symptoms	Uncomplicated malaria treatment	Severe malaria treatment	Fever treatment
No education	1.6±.05	1.5±.03	1.9±.04	.6±.03	.8±.01	.7±.02	.9±.02
Religious	2.0±.04	1.6±.03	2.3±.03	.6±.02	.8±.01	.7±.01	.9±.01
Primary/Partial	2.9±.1	2.5±.1	2.9±.1	.9±.05	.8±.02	.9±.02	1.3±.02
Primary/complete	2.8±.1	2.5±.1	3.2±.1	1.2±.1	.9±.02	.9±.02	1.4±.04
Secondary/Partial	2.4±.1	2.1±.1	2.6±.1	.8±.1	.9±.03	.9±.04	1.3±.05
Secondary/complete	2.8±.1	2.6±.1	3.2±.05	1.1±.05	.9±.02	.9±.02	1.5±.03
University	2.9±.1	2.7±.1	3.3±.07	1.2±.08	.9±.02	.9±.8	1.3±.03
Total	**2.3±.03**	**2.0±.02**	**2.6±.02**	**.8±.01**	**.8±.001**	**.8±.008**	**1.2±.01**
P-value	**.000****	**.000****	**.000****	**.000****	**.000****	**.000****	**.000****

Table 2: Association between overall knowledge about malaria control, treatment and prevention and education level in intervention and control villages of New Halfa Locality

**P-value significant at less than 0.05 levels

DISCUSSION

Although malaria is preventable it remains a leading cause of morbidity and death especially in sub-Saharan Africa (Anchang-Kimbi *et al*., 2017,WHO, 2013), which carries the highest share of the global malaria burden, with 92% of malaria cases and 93% of malaria deaths worldwide in 2017 (WHO,

2018). The most at risk population include pregnant women and children (Anchang-Kimbi *et al*., 2017). Malaria in pregnancy is associated with negative outcomes such as illness requiring hospitalization, anemia and to the unborn child abortions and still births, especially in first time pregnancies (WHO, 2019).

The study showed that the overall mean knowledge about malaria control was more significant among intervention villages compared to control villages. In addition the overall knowledge of respondents regarding uncomplicated malaria symptoms, sever malaria symptoms, uncomplicated malaria treatment, severe malaria treatment and net washing were more significant in intervention villages versus control village due to health education intervention during LLINs distribution campaigns in the targeted villages. There were significant differences between overall knowledge in intervention and control villages regarding mosquito breeding sites, malaria control, uncomplicated malaria symptoms, severe malaria symptoms, uncomplicated malaria treatment, severe malaria treatment, fever treatment and net washing.

This remarkable increase in their knowledge of prevention and case management of malaria, thus corroborating the results from other studies where educational interventions on malaria through community leaders improved knowledge, attitude and treatment seeking behavior among caregivers (CDI Study Group, 2010, Ahmadi *et al*., 2012). The result was further comparable to what was observed in a study of capacity building for village malaria workers' (VMWs) project in Cambodia, where the proportion of VMWs who gave correct answers to all questions regarding malaria symptoms, transmission route, vector breeding places, development time significantly increased after a health education program (Yasuoka *et al*., 2012, CDI Study Group, 2010, Ahmadi *et al*., 2012).

The study showed that there were associations between overall knowledge about malaria control, treatment and prevention and education level in intervention and control villages. This may be because the educational level was a key factor in the knowledge of malaria. However, educated people were more likely to understand the health promotion messages delivered. Because they could read and write in case they received health education leaflets and pamphlets, they are also more likely to comprehend issues of behavioral change. This pattern had been supported by other similar studies (Joshi *et al*., 2008, De La Cruz, 2006).

CONCLUSION

In conclusion, the study showed that an increase in knowledge scores was observed when pre- and post-test scores on malaria prevention and control were compared. Health education packages. i.e., mass media messages during Bed nets campaigns and the role of community leaders on malaria was found to have improved knowledge of malaria prevention and control among the studied community.

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