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ISSN (Online) : 2455 - 3662
SJIF Impact Factor :4.924

EPRA International Journal of **Multidisciplinary Research**

Monthly Peer Reviewed & Indexed
International Online Journal

Volume: 4 Issue:7 July 2018



Published By :
EPRA Journals

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**EPRA International Journal of
Multidisciplinary Research (IJMR)**

INTEGRATION OF MOSQUITO LOTION REPELLENTS TO COMBAT MALARIA INFECTION

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ABSTRACT

Malaria is one of the diseases which is greatly affecting the people's health at the same time leading to death of infants in the sub-Saharan Africa. Being spread by female anopheles mosquito, the use of mosquito nets has been the main way of combating its spread among people. However, since mosquito bites are not restricted to indoor, the use mosquito lotion repellents have been viewed as an alternative. Surprisingly, this measure of combating malaria infection through mosquito bites has been found to be of limited use among people with perceived lack of knowledge and commitment for regular application. Therefore, it is against this background that the study sought to explore practices on Integration of Lotion Mosquito Repellants to Combat Malaria infection among people. The study is quantitative in nature using an Exploratory Study design. Using random sampling technique, data was collected through questionnaires from individuals of Lake Malombe neighborhood in Mangochi, Malawi. Results of the study reveal that there is low usage of mosquito lotion repellents among people in the study area. Apparently, more people rely on taking medication and use of mosquito nets in combating malaria infection through mosquito bites. Therefore, the study recommends sensitization of people on integration of mosquito lotion repellents as a way of combating malaria infection.

KEYWORDS: *Combat, Malaria, Mosquito Bites, Mosquito Lotion Repellents*

INTRODUCTION

Malaria remains the main cause of mortality rate in sub-Saharan Africa (Musoke, Karani, Ssempebwa, & Musoke, 2013). Studies reveal that, worldwide, out of 214 million new cases and 438,000 deaths in 2015 of Malaria, 80% of these cases and 78% of deaths were in Sub-Saharan Africa. Malawi a country in sub-Saharan Africa has not be spared from the threat of Malaria. There is high incidence of transmission mainly by *Plasmodium falciparum* which accounts for 90% of malaria cases (Hammarskjöld, 2018). Though, Malaria high risk of infection in Malawi exists country wide, it is predominant in hotter, wetter and more humid low-lying regions of lakeshore, Shire valley and Central Plain areas of Malawi (Mathangaa, et al., 2013); and figures of infective bites per individual per year in Mangochi (a lakeshore area) ranged from 16 to 27 (Mathangaa, et al., 2013). The need for efforts towards Malaria infection prevention cannot be overemphasized due to perceived effects on people's lives. For instance, in schools Malaria has led to frequent absenteeism among students and teachers whereas in agriculture it as reduced human work force (Davis, 1999). Above all, increased admission of children under-five years and the high infant mortality rates (Zgambo, Mbakaya, & Kalembo, 2017) requires urgency. Worse still, children in Africa are reported to be HIV positive after blood transfusion for their malarial anemic conditions (Langsrud, Haram, & Malmberg, 2013). While there have been efforts to combat the disease, it has been observed that malaria continues to be a threat due to the development of drug resistant *Plasmodium* parasites and insecticides resistant mosquitos (Kidane, Tomass, & Dejene, 2013). Basically, Malaria prevention is associated with arresting mosquito bites while at the same time disrupting its life cycle (Lawal, Adewuyi, Fawehinmi, Adeogun, & Etatuvie, 2012). Numerous methods have been advanced to combat mosquito bites. Among others, wearing long pants and long-sleeved shirts for outdoor living and allowing flow of air in rooms and use of bed nets for outdoor living (Naseem, Malik, & Munir, 2016). In addition, there has been clearing of stagnant water and use of repellents to kill the mosquitoes (Naseem, Malik, & Munir, 2016). However, it has been observed that there no one single measure to deal with mosquito bites (Mbako, Barffo, Nuotol, Alebshehy, & Shuaib, 2017). Mosquito repellents have been widely used to deter mosquito bites as an integration measure to combat mosquito bites or malaria infection. Mosquito repellents are substances applied to clothing, skin or other surfaces to repel the mosquito from attracting and biting the host (Naseem, Malik, & Munir, 2016; Pattanayak & Dhal, 2015). Therefore, three key interventions for mosquito bite prevention have been discovered namely: wearing

Insecticide-Treated Clothing (ITC); Applying Topical Repellents onto skin; and Using Spatial Repellents (Maia, Kliner, Richardson, Lengeler, & Moore, 2015). Traditionally, the use of plants extracts as mosquito repellent such as nicotine in Tobacco have been used to disrupt transmission of malaria parasites (Lawal, Adewuyi, Fawehinmi, Adeogun, & Etatuvie, 2012). The development of synthetic insecticides to combat mosquito have however been associated with environmental hazards and physiological resistance on the parasites (Lawal, Adewuyi, Fawehinmi, Adeogun, & Etatuvie, 2012). The risk of Malaria transmission by female Anopheles mosquito is by the night time dusk to dawn (Hammarskjöld, 2018). Thus, the use of mosquito lotion repellents for outdoor living is paramount in malaria prevention as it reduces mosquito bites (Sangoro, Kelly, Mtali, & Moore, 2014). However, mosquito repellents like DEET (N, N-Diethyl-3-methyl benzamide) have limitations like creating insecticide resistance and difficult to implement on proper usage by users (Kidane, Tomass, & Dejene, 2013). Moreover, lack of compliance by the users due to daily commitment of application and frequent reapplication, accessibility and perceived ease of use (Sangoro, Kelly, Mtali, & Moore, 2014; Sangoro, Kelly, Mtali, & Moore, 2014) remain the to be the challenges. Furthermore, choice of mosquito repellents heavily rely on cost as more people in Malawi are found to use natural products like burning leaves compared to commercial products like mosquito coils and bed nets (Ziba, Slutsker, Chitsulo, & Steketee, 1994). However, this has been partly due to more knowledge of use of plant repellents in local communities compared to access to another substitutes (Kidane, Tomass, & Dejene, 2013). The situation on the use of mosquito lotion repellents in Malawi seem not to take progress. The 2014 Malawi Malaria Survey revealed that 70% of households owned at least one Insecticide-Treated Net (ITN) and 52 % had access to ITN with more children and pregnant mothers using ITN (National Control Programme Malawi, 2015). Therefore, in Malawi Malaria prevention involve mostly provision of insecticide treated nets, effective treatment and alternating preventive treatment for pregnant women (National Control Programme Malawi, 2015). Therefore, this study seeks to understand the status on the use of Mosquito Lotion Repellents as an integration measure in combating Malaria infection.

OBJECTIVES

1. Investigate the frequency of malaria infection among people
2. Find out the ways that are used by the community to combat mosquito bites
3. Discover whether mosquito lotion is used to combat mosquito bites

4. Explain other integrated mosquito repellents used to combat malarial infection

METHODOLOGY

The study is quantitative in nature using Exploratory Study design in studying *Integration of Mosquito Lotion Repellents to Combat Malaria Infection*. Through simple random sampling technique, the study collected data from 50 individuals. Data was collected through questionnaires and analyzed using SPSS. For easy understanding of the topic under discussion both English and vernacular language was used in setting the Questionnaires. The study by any means does not promote any product with regard to mosquito repellents but seek to understand the consumer behavior with regard to malaria infection prevention.

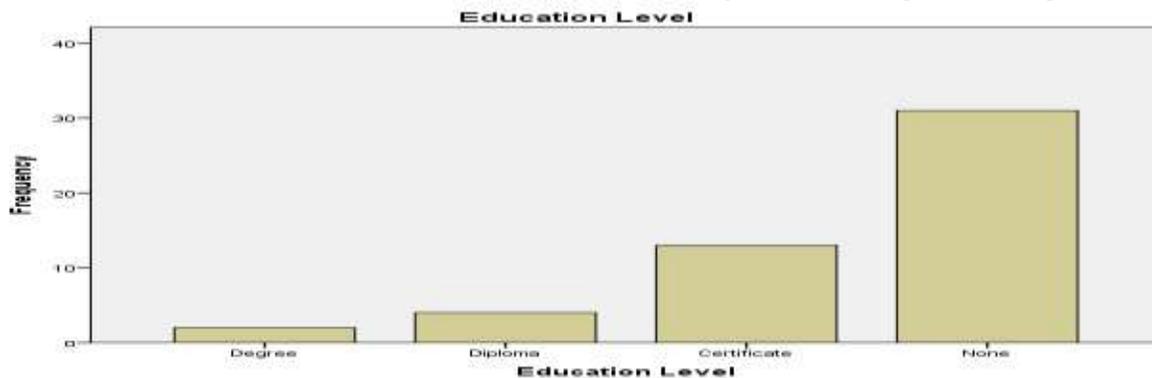
GEOGRAPHICAL AREA

The Lake Malombe Neighborhood, in Mangochi Malawi is one of the lakeshore areas in Malawi hence it is associated with high risk of malaria infection. The area receives high temperatures and due to the lake conditions and it is largely swampy even during the dry season making it a favorable breeding ground for mosquitos.

RESULTS

Level of Education

The study revealed that, majority of participants 31, had no education qualification representing 62%, whereas 26% had certificate followed by 8% who had diploma and 4% had degree. Thus, education could have likely influenced the data collected on the knowledge of use of mosquito lotion repellents.



1. Frequency of Malaria Infection in Homes

The study also wanted to find out how often people develop malaria infection. The data reveal that there is 48% likelihood to develop malaria infection. Ideally, being a hot and humid area in summer the place is

likely a breeding ground for mosquitos hence leading to more infective bites. This therefore, increases the chance of infection among people in this community. Earlier studies have acknowledged that figures of infective bites per individual per year in Mangochi in general ranges from 16 to 27 (Mathangaa, et al., 2013).

Frequency of Malaria Infection

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very often	10	20.0	20.0
	Often	14	28.0	48.0
	Less often	18	36.0	84.0
	None	8	16.0	100.0
	Total	50	100.0	100.0

Usage and Knowledge of Mosquito Lotion Repellents

The study also sought to know the usage of mosquito lotion repellents as a combat to mosquito bites. Consequently, results revealed that only 11 participants (22%) used the mosquito lotion repellents before compared to 39 (78%) whom in their life time did not use this repellent method. Thus, the results reveal possible lack of knowledge on the use of lotion mosquito repellents. Consequently, this seems not surprising as the Malaria survey revealed that the main

way of combating malaria have been provision of insecticide treated nets, effective treatment and alternating preventive treatment for pregnant women (National Control Programme Malawi, 2015). Furthermore, it has been found that where there is use of alternative methods to prevent mosquito bites very few people would endeavor to buy and use mosquito lotion repellents (Goorah, Russeeawon, & Ramchurn, 2014). As a result, this has given less room for integration of mosquito lotion repellents in combating malaria among community members in this study.

Moreover, results also revealed that of the 22% of those who had once used mosquito lotion repellents they came to know it from colleagues whereas others got information from the nearby clinics. Therefore, if the use of mosquito lotion repellents is to be encouraged as preventative measure against malaria, knowledge dissemination would be crucial beginning with clinics, schools, community gatherings alongside advertising in media.

Effectiveness of Mosquito Repellents from Mosquito Bites

As regards the effectiveness of the mosquito lotion repellents results revealed that it is very effective. However, participants bemoaned that it is temporal as it only works for a specific period of time. Apparently, this remains the major challenge with the use of mosquito lotion repellents. For instance, it has been found that lack of compliance by users due to daily commitment of application and frequent reapplication negatively affect regular use of mosquito repellents (Sangoro, Kelly, Mtali, & Moore, 2014).

Therefore, the consistent use of mosquito lotion repellents while doing outdoor would greatly improve the effectiveness of such a method.

Measures in Combating Malaria infection Other Than Use of Lotion Repellents

As regards to other measures used in dealing with malaria infection and prevention results reveal two most common methods used by participants. It transpired that 38 participants (76%) used mosquito nets whereas 12 (24%) relied on taking of medication like Lumefantrine-Artemether (LA). Some participants however depended on use of plant repellants as a primary measure for reducing malaria infection through mosquito bites. With regard to the use of plant repellents compared to mosquito lotion repellents Kidane, Tomass and Dejene (2013) discovered that there is perceivable knowledge of use of plant repellents in local communities compared to access to other substitutes. Hence, this could likely be the main reason for people using the local plant mosquito repellents in pursuit of malaria infection prevention.

Measures in Combating Malaria Infection

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Using mosquito net	38	76.0	76.0	76.0
Taking medication	12	24.0	24.0	100.0
Total	50	100.0	100.0	

CONCLUSION

The study has revealed low usage of mosquito lotion repellents among people in Lake Malombe Neighborhood. There is perceivable lack of knowledge with regard to the integration of this repellents in combating malaria. Furthermore, it has been found that more people use mosquito nets in order to combat malaria. Thus, while mosquito nets and taking of medication remains the basic ways in malaria prevention, the appropriate and regular use of mosquito lotion repellents would go a long way in curbing the mosquito bites among people as it has been seen to be effective in reducing mosquito bites. However, for this to work requires, effort with regard to dissemination of information be it in schools, public gatherings and even in clinics on its importance and appropriate use. Moreover, incorporating such measures in school curriculum would also be crucial in building a culture on integration such methods in the fight against malaria infections in communities.

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