Malaria Control & Elimination
ISSN: 2470-6965

Oleribe et al., Malar Chemoth Cont Elimination 2017, 6:2
DOI: 10.4172/2470-6965.1000159

Research Article OMICS International

Use of Mosquito Nets: Is it Time to Think Differently?

Oleribe Obinna O[1,2], Akpalu A[2,3], Ayegua-Hagan N[2,3], Akande T[2,4] and Taylor-Robinson S.D[2,5]

[1]*Excellence and Friends Management Care Centre (EFMC), Abuja, Nigeria*
[2]*West African College of Physicians, Lagos, Nigeria*
[3]*Korle Bu University Teaching Hospital, Accra, Ghana*
[4]*College of Medicine, University College Hospital, Ibadan, Oyo State*
[5]*Hepatology Unit, Imperial College, London, United Kingdom*
[6]*QEQM Building, St Mary's Hospital Campus, South Wharf Road, W2 1NY, London, United Kingdom*

Abstract

While the Millennium Development Goal 6 has concentrated on malaria elimination strategies with some degree of success, reflected in falling morbidity and mortality over the past 15 years, the situation in Africa is not as promising as the rest of the world. We wondered how effective the message to use insecticide-treated mosquito nets was and with this in mind, in September 2016, we undertook a survey of highly-trained doctors from Nigeria and Ghana, attending Millennium Development Goal 6 postgraduate training courses in Ibadan and Accra to assess whether they practiced antimalarial personal protection policies themselves. Surprisingly, over 40% of the doctors in the Accra survey did not even own a mosquito net with 20% in Ibadan. Only 7% of those in Ghana used their nets daily, rising to 20% in the Nigerian respondents. We conclude that further public health measures are needed to bring home the message that mosquito nets should be used on a daily basis in endemic areas and that no section of society is exempt.

Keywords: Malaria; Control; Elimination; ITN; Accra; M-PACT

Introduction

In 2013, the Royal College of Physicians of London and the West African College of Physicians partnered to tackle the Millennium Development Goal 6 through postgraduate medical clinical training programmers of early-career specialist physicians in the West African region. These training schemes focused on the management of malaria, tuberculosis, HIV/AIDS, outbreak management of Ebola viral disease and other hemorrhagic viral diseases. This partnership, funded by Eco bank Foundation has seen over 300 doctors trained in intensive courses in Nigeria, Ghana and Sénégal. Nevertheless, by the close of 2015, most of the MDGs were not achieved within the West African region. Malaria has remained a major worldwide cause of morbidity and mortality [1,2] and it accounts for up to 60% of all outpatient attendance in African hospitals [3,4]. Over the years, mosquito nets have been marketed as a key strategy towards the elimination of malaria. Insecticide-treated nets (ITNs) have been at the forefront of MDG6 public health malaria prevention programs [5-7]. Globally, over $2.5 billion is spent in controlling malaria [1,2] and the majority of these funds are now used to procure long lasting insecticide-treated (LLITN) bed nets. With ITNs and indoor residual spraying (IRS) as the principal tools for malaria vector control globally, studies have shown that increased use of LLITNs reduces significantly the malaria transmission intensity [5-7]. With this in mind, studies show a 66% reduction in malaria incidence rates around the world from 2000 to 2015 (but only a 42% reduction in Africa) with a 60% reduction in worldwide mortality between 2000 to 2015 [1,2]. In 2015, there were still 214,000,000 malaria cases in Africa, resulting in over 400,000 deaths [1,2]. We wondered how widespread the use of mosquito nets was in West Africa, given that the burden of disease is predominantly in the African continent. If educated people are not taking precautions, then we hypothesized that there was less chance of the general population using ITNs. Therefore, in September 2016, at MDG 6 training sessions for doctors in Accra, Ghana and Ibadan, Nigeria, we sought to ask whether educated specialists adopt the recommendations on ITN usage themselves.

Methodology

During two concurrent postgraduate training sessions on malaria for doctors attending the West African College of Physicians Millennium Development Goal 6 Partnership for African Clinical Training (M-PACT) Training Program in Accra and Ibadan in September 2016, we asked four simple questions on personal protection measures that the highly educated medical attendees might have taken in their daily lives:

1. Did you use mosquito nets last night?
2. Did you use mosquito nets over the past one week?
3. Do you have a mosquito net?
4. Have you ever used a mosquito net at all?

All training session participants present at the time in Accra and Ibadan were included in the survey with the knowledge that their anonymized, pooled responses would be used for educational purposes. Participants were free to refuse participation, and participants who were not in the class at the time of the survey were not included in the study. Responses were tallied and simple percentages calculated using Microsoft Excel.

Results

Of 42 participants and faculty in Accra, 17 (40.5%) had never used

***Corresponding author:** Oleribe Obinna O, Excellence and Friends Management Care Centre (EFMC), Abuja Nigeria Hebron, Plot 5E Excellence & Friends Street, P.O.Box 200 PSIN Post Office, Dutse Abuja, Nigeria, Tel: 23497800073; E-mail: obinna.oleribe@expertmanagers.org

Received September 27, 2017; **Accepted** October 16, 2017; **Published** October 30, 2017

Citation: Oleribe OO, Akpalu A, Ayegua-Hagan N, Akande T & Taylor-Robinson SD (2017) Use of Mosquito Nets: Is it Time to Think Differently? Malar Chemoth Cont Elimination 6: 159. doi: 10.4172/ 2470-6965.1000159

Copyright: © 2017 Oleribe OO, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

mosquito nets. Only 3 (7.1%) used mosquito nets the night before the class and 4 (9.2%) within one week of the class, respectively. In Ibadan, the use rate was slightly different as of the 25 respondents, 5 (20.0%) had used mosquito nets during the night before and 6 (25.0%) within the week of the class. In Ibadan, 20 (80.0%) had nets in their homes, but again, 5 (20.0%) had never used nets. In general, 56.0% of physicians in this study had nets while 12.0% used nets the night before and 15.0% used nets within the week of the course, as shown in Table 1. This finding is at variance to the high ITN use among people documented in previous studies [8-10].

Qualitatively, the use of house paints, mosquito nets, and other strategies to control malaria was extensively discussed (Figure 1).

Discussion and Conclusion

Our survey population was comprised of highly educated specialists and senior trainees in internal medicine, family medicine, public health and psychiatry, who see malaria cases every day with its fatalities and complications. These individuals have spent their lives treating malaria and its complications in their patients and their families, prescribing insecticide-treated nets and encouraging the general public to use them. Our results are therefore surprising that medical leaders pay scant regard to their own healthcare and that few use ITNs on a regular basis despite living in malaria endemic region of the world where 100% of the population are at risk [11]. This calls into question the quality of the medical advice given, if those issuing it do not abide by the regulations themselves. It also brings to mind how many people are really using these nets as they should and how many in poor, rural communities use their ITNs as fishing nets, rather than as personal protection. Furthermore, how many of the general population sleep regularly under the nets remains unknown in West Africa. Studies have shown that ownership of nets is still low in the general population, which is as low as 3% to over 80% in some communities [12]. Furthermore, while ownership is low, proper ITN use is lower with problems with hanging up nets, lack of space, low awareness of need, and seasonal variations in use as major reasons for non-use [12].

The low ITN ownership and usage rates recorded in this study may be ascribed to selection bias, which is common in small cross-sectional surveys [13]. Nevertheless, it highlights a problem. To control, eliminate or eradicate malaria, there needs to be more effective public health messages that ITNs are to be used by everyone, no matter their background and on a daily basis. Furthermore, the various hindrances to ITN use including overheating of those sleeping underneath, claustrophobia and pruritus amongst others should be addressed and not just documented and disregarded. There also needs to be better, more effective and efficient techniques to teach people the correct usage of ITNs.

However, despite noble aims with the MDG6 ITN policy, it should be borne in mind that in communities with antimalarial-resistant

	Accra (N=41)		Ibadan (N=25)		Total (N=66)	
	Frequency	Percentage	Frequency	Percentage		
Used mosquito net last night?	3	7.14%	5	20.00%	8	12.12%
Used mosquito net in the last one week?	4	9.52%	6	24.00%	10	15.15%
Have a mosquito net at home?	17	40.48%	20	80.00%	37	56.06%
Have never used a mosquito net ever	18	42.86%	5	20.00%	23	34.85%

Table 1: Ownership and use of mosquito nets by physicians in M-PACT course in Accra Ghana and Ibadan, Nigeria.



Figure 1: Bill board advertising a brand of paint that prevents malaria in Accra, Ghana.

parasites, sleeping under a net has been no more protective than sleeping under an untreated net, regardless of its physical condition. This further threatens malaria control strategy, solely based on ITN [14]. Therefore; focusing on the malarial vector itself is an important strategy, rather than just on personal protection against mosquitoes. Eliminating malaria-causing mosquitoes should be the focus of future global health drives, as relying on human behavioral change in ITN usage is a risky unrealistic strategy, judging by poor implementation till date in Africa. To this end, environmental control, and biogenetic manipulations may provide the magic bullets needed to eliminate or eradicate malaria in endemic countries.

Some houses in Accra use paint impregnated with insecticide [15], which though may be effective has not been approved by the malaria control program. Recent proliferation of air conditioners (Nigeria) and wall paints (Ghana) claiming to fight malaria (i.e., that they have anti-mosquito properties) should be reviewed, their effectiveness assessed and required approvals given if found effective for their universal use. This will help minimize deceptive claims and improve malaria control in the sub-Saharan Africa region.

Acknowledgements

All authors are involved in delivering/evaluating the joint RCP-WACP M-PACT educational program on TB, HIV, malaria and disease outbreak management in West Africa between 2014- 2017. The authors are grateful to Eco bank Foundation (Lomé, Togo) and to the Wellcome Trust Institutional Strategic Support Fund at Imperial College London for funding support and to useful discussions with Professor Jane Dacre (President), Professor David Warrell (International Director) and Ms. Winnie Wade (Head of the Educational Unit) at the Royal College of Physicians of London. We also acknowledge the National training centers - University College Hospital, Ibadan, Oyo State, Nigeria and Korle Bu Teaching Hospital, Accra, Ghana. Finally, we wish to acknowledge all the Cohort 4 participants of M-PACT Course in the centers that responded to the survey.

Competing Interests

The authors declare no competing interest.

References

1. World Health Organization (2015) World malaria report.
2. World Health Organization (2015) Malaria: Fact sheet; world malaria report 2015.
3. Alemayehu G, Melaku Z, Abreha T, Alemayehu B, Girma S, et al. (2015) Burden of malaria among adult patients attending general medical outpatient department and HIV care and treatment clinics in Oromia, Ethiopia: A comparative cross-sectional study. Malar J 14: 501.
4. Ajayi IO, Falade CO (2006) Pre-hospital treatment of febrile illness in children attending the General Outpatients Clinic, University College Hospital, Ibadan, Nigeria. Afr J Med Med Sci 35: 85-91.
5. Protopopoff N, Wright A, West AP, Tigererwa R, Mosha MF, et al. (2015) Combination of insecticide treated nets and indoor residual spraying in northern Tanzania provides additional reduction in vector population density and malaria transmission rates compared to insecticide treated nets alone: A randomised control trial. PloS one 11(1): e0146629.
6. Russell TL, Govell NJ, Azizi S, Drakeley CJ, Kachur SP, et al. (2011) Increased proportions of outdoor feeding among residual malaria vector populations following increased use of insecticide-treated nets in rural Tanzania. Malar J 10: 1-80.
7. West PA, Protopopoff N, Wright A, Kivaju Z, Tigererwa R, et al. (2014) Indoor residual spraying in combination with insecticide-treated nets compared to insecticide-treated nets alone for protection against malaria: a cluster randomised trial in Tanzania. PLoS Med 11(4): e1001630.
8. Bennett A, Smith SJ, Yambasu S, Jambai A, Alemu W, et al. (2012) Household possession and use of insecticide-treated mosquito nets in Sierra Leone 6 months after a national mass-distribution campaign. PLoS One 7(5): e37927.
9. Okoyo C, Mwandawiro C, Kihara J, Simiyu E, Gitonga CW, et al. (2015) Comparing insecticide-treated bed net use to Plasmodium falciparum infection among schoolchildren living near Lake Victoria, Kenya. Malar J 14: 1-515.
10. Zhou G, Li JS, Ototo EN, Atieli HE, Githeko AK, et al. (2014) Evaluation of universal coverage of insecticide-treated nets in western Kenya: field surveys. Malar J 13: 1-351.
11. https://www.pmi.gov/
12. Singh M, Brown G, Rogerson SJ (2013) Ownership and use of insecticide-treated nets during pregnancy in sub-Saharan Africa: A review. Malar J 12: 1-268.
13. Berk RA (1983) An introduction to sample selection bias in sociological data. Am Sociol Rev 48: 386-398.
14. Asidi A, N'Guessan R, Akogbeto M, Curtis C, Rowland M (2012) Loss of household protection from use of insecticide-treated nets against pyrethroid-resistant mosquitoes, benin. Emerg Infect Diseases 18: 1101-1106.
15. http://www.durabilityanddesign.com/news/

Citation: Oleribe OO, Akpalu A, Ayegua-Hagan N, Akande T & Taylor-Robinson SD (2017) Use of Mosquito Nets: Is it Time to Think Differently? Malar Chemoth Cont Elimination 6: 159. doi: 10.4172/ 2470-6965.1000159