Knowledge attitude and cultural factors toward utilization of insecticide treated nets (ITNS) among Rakhine ethnic group in Ann Township Rakhine State Myanmar: Cross sectional study

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Aung Phyo Oo and Sathirakorn Pongpanich
College of Public Health Sciences, Chulalongkorn University, Bangkok, Thailand

Abstract

Purpose - Malaria is a life threatening disease; however, it can be prevented by the use of insecticide treated nets (ITNs). It is crucial to understand knowledge, attitudes, utilization of ITNs, and cultural factors in order to eliminate malaria among people. This study aimed to find associations between general characteristics, knowledge, attitudes and cultural factors toward utilization of ITNs among Rakhine ethnic groups, Rakhine State, Myanmar.

Design/methodology/approach - A cross-sectional study was conducted among 420 Rakhine ethnic groups, age from 18 years old and over. They were recruited from 10 villages in Ann Township, and were face to face interviewed in June, 2018. Chi-square test, Fisher's exact test and logistic regression were employed to analyze association between dependent and independent variables.

Findings - Only 3.6% of respondents had good level of knowledge, 19.0% good level of attitude, and 38.8% good level of practice towards utilization of ITNs. Factors associated with good practice were female participants (*p*-value <0.001, AOR 8.015, 95% CI=3.395-18.923), high school level (*p*-value <0.001, AOR 14.518, 95% CI=4.642-45.408), married participants (*p*-value <0.001, AOR 13.753, 95% CI=4.371-43.267), widowed participants (*p*-value 0.039, AOR 5.403, 95% CI=1.085-26.909), knowledge level (*p*-value <0.001, AOR 5.125, 95% CI=1.062-6.429). For cultural factors, participants who always worked from dawn to night time (*p*-value 0.032, AOR 2.203, 95% CI =1.070-4.536).

Originality/value - Government and NGOs should integrate health education and encourage people to use ITNs rather than using a traditional approach.

Keywords Malaria, Knowledge attitude cultural factors, Utilization of insecticide treated nets, Myanmar

Paper type Research paper

Introduction

Malaria is an infectious disease and it is a most concerning public health problem worldwide, especially in Africa and Southeast Asia countries. It is caused by a parasite that infects certain type of infected mosquitos. People who infected by malaria presented with high fever along with chills and rigor. Despite malaria is a life threatening disease if leave untreated, it can be prevented and cured with proper prevention and treatment methods. In prevention methods, the most effective method is to cut off the contact of human beings and mosquitos through the use of insecticide treated nets (ITNs) or long lasting insecticidal treated nets (LLINs) [1].

According to world malaria report 2016 by WHO, there is a substantial progress in fighting malaria since 2000. According to the latest estimates between year 2000 and 2015, there were 41% reduction of malaria incidence and 62% reduction in mortality rates. By the year 2016, 91 countries and territories were still considered to be endemic, the number reduced from 108 in 2000. The number of malaria cases globally reduced from an estimated 262 million in 2000, to 214 million in 2015. The trend of malaria deaths reduction from 839,000 in 2000 to 438,000 in 2015 could be seen globally [2].

In Southeast Asia (SEA), 32 million new cases, and 43,000 deaths are estimated for 2010 [3]. The Greater Mekong Sub region (GMS) is a very high-risk region for malaria. Among all the population, around 70 % of the population is on risk of malaria infection and 26 % are still living in a high-risk area [4, 5].

Myanmar, one of the countries in Greater Mekong Sub region (GMS) regions, is the one with the greatest morbidity and mortality from malaria [4]. According to the risk area stratification, total 180 townships in the year 2012, 61.7 % of population was living in malaria endemic areas. Vector control in Myanmar is focus on distribution of insecticide treated nets (ITNs) and mainly to communities in remote areas, pregnant women and children in moderate to high risk areas. Also, national policy in Myanmar make the use of ITNs for preventing and controlling malaria. One of the main implementation strategies include free delivery of LLINs and free retreatment of mosquito nets before the rainy season and winter at which the malaria transmission is high. These implementation are for ensuring people who living in high-risk malaria areas can protect themselves [6].

In Myanmar, national races (ethnic groups) living in villages near or in the forest are the most vulnerable from malaria cases and deaths. Most of them living from subsistence agriculture supplemented by forest activates, such as bamboo or rattan cutting or rubber plantation [7]. There are also high morbidity and mortality of malaria in area of ethnic minorities also in the border areas because of the topography and climate conditions that facilitate malaria transmission. In addition, also because of few transportations in these remote areas, low literacy rates, few health services, high population mobility and the prevalence of multidrug-resistant *P. falciparum* [8].

Rakhine State is surrounded by Rakhine Mountain Range and the Bay of Bengal and is situated in western part of Myanmar. Many mountainous areas make the transportation difficulties and lead to poverty. Literacy rate is also low comparing with other states in Myanmar. Therefore, Rakhine is one of the undeveloped state in Myanmar [9]. Rakhine State is one of the malaria highest-risk areas in Myanmar. Each year, Rakhine State contributes about 20-25% of total malaria cases in Myanmar [10]. During 2000 – 2014, the malaria morbidity and mortality rates in Rakhine State reduced because of National Malaria Control Programme, International Non-Governmental Organizations (INGOs) and local NGOs were conducted malaria case management through mobile and fixed clinics. Also malaria prevention and control programs through distribution of INTs. However Ann Township is still high in malaria positivity rates [10]. The cultural beliefs of specific ethnic groups is also the main issue in malaria as they can lead to wrong behaviors. Thus, the understanding of ethnic groups and their behavior can lead to more successful in controlling malaria. By acquiring these information, the reduction of malaria burden in local population as well as transmission to other vulnerable areas can be achieved. In the study of malaria control in the ethnic minority regions in Northern Myanmar along China border, the use of ITNs in ethnic minority groups was still low and need more health education about ITN utilization [11]. In the study of malaria control in Tribal community in India, believing evil spirits as the cause of malaria and rely on traditional healers is a major difficulty to timely diagnosis and treatment of malaria. Providing bed nets alone may not be sufficient. The health education for sociocultural perceptions and preventive behaviors in the community in still needed [12].

Since prevention and control of malaria is important to malaria elimination, we need to concentrate in community knowledge and attitudes on insecticide treated nets which is one of the most important preventive measure for malaria. Also the cultural beliefs of specific ethnic groups were the main issue in malaria as they can

lead to wrong behaviors. So, it is crucial to know the knowledge, attitudes and utilization of insecticidal nets in population as well as the exploration of their cultural beliefs can provide us with many information for further prevention and control of malaria in the specific regions.

The purpose of this research was to access the knowledge, attitude and cultural factors toward utilization of mosquito nets among Rakhine ethnic groups in Ann Township. Hypothesis was there are associations between demographic characteristic, knowledge, attitudes and cultural factors on malaria prevention toward utilization of insecticidal nets among Rakhine ethnic groups, in Ann Township, Rakhine State, Myanmar.

Method

Study design

A cross-sectional study was conducted in June, 2018 to determine the knowledge, attitudes and cultural factors regarding utilization of insecticide treated nets (ITNs) among ethnic groups in Ann Township, Rakhine State, Myanmar. From total of 290 villages in Ann Township, 117 villages with majority of Rakhine ethnic group and high malaria incidence were selected purposively. After that, 10 villages from 117 villages were selected by simple random sampling method.

Sample size determination and sampling procedure

Four hundred and twenty participants were selected with proportion of household number from each villages starting from a random point using calculated interval. Inclusion criteria were 1) both male and female with age more than 18 years old 2) individual who agree and willing to participate in this study 3) being a member of selected household and living in Ann Township more than one year 4) Rakhine ethnicity. Exclusion criteria were 1) Individual who have mental health problems 2) Individual who have severe illness. Sample size was calculated by using the Cochran formula with significant level of 5% and 95% confidence level plus the estimate 10% of participant who will not participate.

Data collection was done by face to face interviews using pre-coded and pre-tested structured questionnaires which were validated by 3 malaria experts. The questionnaires were prepared in both English and Myanmar languages. The questionnaires were design to collect information on general characteristic, knowledge of malaria, attitude toward malaria, cultural factors of participants and utilization of insecticide treated nets. Interviews were conducted by research assistants who were selected from local community and trained about the objective of the study, the content of questionnaires, data collection process and practicing in real condition before the study. All the research assistants recruited were from non-governmental organization that implemented research activities on malaria and they were able to speak and write Rakhine language, knew the transportation routes to the study areas and their current position in the organization were research assistant.

Data management

All the data collected during the survey were checked for any error and completeness daily. Collected data were entered and coded in SPSS version 22 (licensed by University). Analysis was performed using SPSS. Chi-square test and Fisher's Exact test was used to determine the relationship between general characteristic, knowledge, attitude and utilization of mosquito nets. The variables which had relationship with practice level on utilization of insecticide treated nets and variables which had p-value less than 0.2 were then analyzed further by logistic regression at the level of statistical significant of 5% and confident interval of 95%.

Ethical consideration

The Research Ethics Review Committee for Research Involving Human Research Participants, Health Sciences Group, Chulalongkorn University was approved this study with COA no. 137/2018. All the procedures of the research were explained and got the permission and consent of the respondents.

Results

Table 1 showed the relationship between knowledge level and practice level regarding utilization of insecticide treated nets. There was a significant relationship between knowledge level and practice level with *p*-value of <0.001 using chi-square test. All of the respondents with good knowledge level (100.0%) had good practice level. Most of the participants who had moderate knowledge level (61.0%) were in good practice level. Only 28.5% of participants who had poor knowledge level had a good practice level.

Regarding the relationship between attitude level and practice level regarding utilization of insecticide treated nets, there was a significant relationship with *p*-value of <0.001 by chi-square test (Table 2). Respondents with good attitude level (66.3%) had good practice level compared to other participants. Most of the poor practice level were seen in participants with poor attitude level (65.5%) and moderated attitude level (68.4%).

Table 3 showed relationship between cultural factor and practice level toward utilization of insecticide treated nets. There was a strong relationship between working from dawn to night times and practice level toward utilization of insecticide treated nets with *p*-value of <0.001 using chi-square test.

Table 1. Relationship between knowledge level and practice level regarding utilization of insecticide treated nets

Knowledge level	n=420	Practice level (n%)		*p*-value
		Poor	Good	
Poor	305	218(71.5)	87(28.5)	<0.001*
Moderate	100	39(39.0)	61(61.0)	
Good	15	0(0.0)	15(100.0)	

Note: *Significant by chi-square test

Table 2. Relationship between attitude level and practice level regarding utilization of insecticide treated nets

Attitude level	n=420	Practice level (n%)		*p*-value
		Poor	Good	
Poor	84	55(65.5)	29(34.5)	<0.001*
Moderate	256	175(68.4)	81(31.6)	
Good	80	27(33.8)	53(66.3)	

Note: *Significant by chi-square test

Table 3. Relationship between cultural factor and practice level toward utilization of insecticide treated nets

	Total (n=420)	Practice level (n%)		*p*-value
		Poor	Good	
Traditional belief about malaria				
Malaria is caused by the punishment of supernatural existence from ancestry				
Disagree	363	221(60.9)	142(39.1)	0.911
Neutral	12	8(66.7)	4(33.3)	

(continued)

Table 3. Relationship between cultural factor and practice level toward utilization of insecticide treated nets

	Total (n=420)	Practice level (n%)		*p*-value
		Poor	Good	
Agree	45	28(62.2)	17(37.8)	
Children are most affected by cerebral malaria and die because they have bad Karma in previous lives				
Disagree	370	227(61.4)	143(38.6)	0.441
Neutral	15	11(73.3)	4(26.7)	
Agree	35	19(54.3)	16(45.7)	
Malaria can be prevented by worshiping to the previous ancestry or supernatural god				
Disagree	362	220(60.8)	142(39.2)	0.506
Neutral	16	12(75.0)	4(25.0)	
Agree	42	25(59.5)	17(40.5)	
Malaria can be easily cured by taking herbs and traditional plants				
Disagree	368	218(59.2)	150(40.8)	0.184
Neutral	6	4(66.7)	2(33.3)	
Agree	46	35(76.1)	11(23.9)	
Malaria can be cured only by spiritual healer				
Disagree	363	218(60.1)	145(39.9)	0.189
Neutral	9	8(88.9)	1(11.1)	
Agree	48	31(64.6)	17(35.4)	
Practice of daily activity				
Do you usually get up early in the morning (dawn)?				
Never	34	16(47.1)	18(52.9)	0.278
Sometime	0	0(0.0)	0(0.0)	
Always	386	241(62.4)	145(37.6)	
Do you usually work from dawn to the night times?				
Never	331	187(56.5)	144(43.5)	<0.001*
Sometime	0	0(0.0)	0(0.0)	
Always	89	70(78.7)	19(21.3)	
How often do you wear long sleeves shirts and pants when you work from dawn to the night times? (n=89)				
Never	19	11(57.9)	8(42.1)	0.413
Sometime	8	8(100.0)	0(0.0)	
Always	62	51(82.3)	11(17.7)	

Note: *Significant by Fisher's Exact test

Table 4. The association (multivariate model) between general characteristic, knowledge level, attitude level, cultural factors and practice level toward utilization of insecticide treated nets

Variables	Poor practice	Good practice	Adjusted OR	95% CI		*p*-value
				Upper	Lower	
Age group (years)						
18-24 **	16(59.3)	11(40.7)	1			
25-44	120(56.9)	91(43.1)	0.848	0.277	2.599	0.773
45-64	89(61.8)	55(38.2)	0.395	0.128	1.219	0.106
>65	32(84.2)	6(15.8)	0.456	0.097	2.138	0.319
Gender						
Male **	89(80.2)	22(19.8)	1			
Female	168(54.4)	141(45.6)	8.015	3.395	18.923	<0.001*

(continued)

Table 4. (continued)

Variables	Poor practice	Good practice	Adjusted OR	95% CI		*p*-value
				Upper	Lower	
Education						
Illiterate or no formal education**	91(78.4)	25(21.6)	1			
Primary school level	109(70.3)	46(29.7)	1.211	0.608	2.410	0.586
Middle school level	40(56.3)	31(43.7)	2.717	1.140	6.474	0.024*
High school level	14(23.3)	46(76.7)	14.518	4.642	45.408	<0.001*
Collage/University level	3(16.7)	15(83.3)	3.424	0.571	20.533	0.178
Types of occupation						
Related with forest **	117(68.4)	54(31.6)	1			
Not related with forest	3(13.0)	20(87.0)	1.921	0.339	10.871	0.461
Dependent	128(59.5)	87(40.5)	0.613	0.331	1.137	0.121
Others	9(81.8)	2(18.2)	0.180	0.030	1.077	0.060
Average income per month (Kyats)						
0 - 100,000 **	50(64.1)	28(35.9)	1			
100,001 - 200,000	123(71.1)	50(28.9)	0.538	0.264	1.097	0.088
200,001 or more	84(49.7)	85(50.3)	1.682	0.833	3.395	0.147
Marital status						
Single **	31(55.4)	25(44.6)	1			
Married	199(60.1)	132(39.9)	13.753	4.371	43.267	<0.001*
Widowed	27(81.8)	6(18.2)	5.403	1.085	26.909	0.039*
Work from dawn to night time						
Never **	187(56.5)	144(43.5)	1			
Always	70(78.7)	19(21.3)	2.203	1.070	4.536	0.032*
Malaria can be easily cured by taking herbs and traditional plants						
Disagree + Neutral **	222(59.3)	152(40.7)	1			
Agree	35(76.1)	11(23.9)	0.822	0.534	1.268	0.376
Malaria can be cured only by spiritual healer						
Disagree + Neutral **	226(60.8)	146(39.2)	1			
Agree	31(64.6)	17(35.4)	1.360	0.871	2.123	0.176
Knowledge level						
Poor **	218(71.5)	87(28.5)	1			
Moderate + Good	39(33.9)	61(66.1)	5.125	2.379	11.041	<0.001*
Attitude level						
Poor **	55(65.5)	29(34.5)	1			
Moderate	175(68.4)	81(31.6)	0.855	0.448	1.630	0.634
Good	27(33.8)	53(66.3)	2.613	1.062	6.429	0.086

Note: * Statistical significance at *p*-value <0.05; ** Reference group

Multivariate analysis

The variables were further analyzed with multivariable model by adding variables which were associated with practice level as well as variables with *p*-value less than 0.2 with chi-square test. Regarding gender of the participants, female participants were 8.015 times had good practice level than male participants (*p*-value <0.001, adjusted OR 8.015, 95% CI). For the education, high school level participants were tend to use ITNs for 14.518 times than lower education level (*p*-value <0.001, adjusted OR 14.518, 95% CI). For marital status of the participants, married participants were 13.753 times done good practice (*p*-value <0.001, adjusted OR 13.753, 95% CI) and widowed participants were 5.403 times done good practice than reference group (*p*-value 0.039, adjusted OR 5.403, 95% CI). For

working from dawn to night time, the participants who always worked from dawn to night time were 2.203 times tend to have good practice level than who never work at that time (*p*-value 0.032, adjusted OR 2.203, 95% CI). Regarding knowledge level, participants who had moderate and good knowledge level were 5.125 times had good practice level (*p*-value <0.001, adjusted OR 5.125, 95% CI) than lower knowledge level participants, Table 4.

Discussion

In this study, female participants had more practice level on utilization of insecticide treated nets than male participants. According to nature of rural areas in Myanmar, males are more likely to work in the field and usually sleep in the field without mosquito nets. In a study of gender differences in the use of insecticide-treated nets n Kano State, Nigeria also showed that females were more likely to use ITNs compared to males [13]. The education level of the participant had a significant association with practice level on utilization of ITNs with *p*-value of <0.001. In multivariate model, the higher the education level of the household leaders, the higher the practice level on utilization of insecticide treated nets. In the study of utilization of insecticide treated nets in Arbaminch Town and the malarious villages of Arbaminch Zuria District, Southern Ethiopia also found that an increase in the educational level of head of household increased the odds utilization of ITNs [14]. The marital status of the participants had significant association with practice level on utilization of ITNs. After added to multivariate model, the result showed that married participants were more likely to use ITNs for prevention of malaria than others. This result was similar to the result of the study done in Huong Hoa District, Quang Tri Province, Vietnam which found that people who were married were having good preventive behavior than those who were single [15]. For cultural factors, the participants who worked from dawn to night time had better practice level toward utilization of ITNs. This finding was similar in the research of universal coverage and utilization of insecticide-treated bed nets in migrant plantation workers in Myanmar which find that the consistent utilization of ITNs was higher in workers who always worked at night for the plantation [16]. Therefore, it could be concluded that the respondents who never worked from dawn to night times were inconsiderate about their behaviors in malaria prevention even though they lived in malaria endemic area. Regarding knowledge level of malaria, the moderate and good knowledge level participants had a good practice level than poor knowledge level participants. This finding was similar with the result of the research done in Maji District, Bench Maji Zone, Southwest Ethiopia which showed that having higher level malaria knowledge increased the like hood of ITNs utilization by 10 times and moderate level malaria knowledge increased by 2 times than low knowledge level of malaria [17].

Limitation

There were some limitations and restrictions in this study as this study used a cross-sectional design and moreover the study cannot find out respondents' knowledge level, attitude level and utilization of mosquito nets over time. In addition, the causes of low knowledge and practice level toward utilization could not determine in this study.

Conclusion

Since the knowledge level of the participants needed to improve according to this study especially in cause of malaria is still needed. To improve the knowledge, government sectors as well as non-governmental organizations should train and

encourage each volunteer to give the health education in their village apart from giving only diagnosis and treatments as they are the closet to the community. For the attitude on malaria, community empowering activities by giving information, education and communication about personal protective measures with the ethnic language should be encouraged. Practice on utilization of ITNs in this study was poor so apart from distribution of ITNs, it should integrated with health education sessions and encourage the people to sleep under ITNs every night and everywhere. According to this study, low knowledge level and poor practice level was found. It required additional information for understanding the main causes to explain the low knowledge level and poor practice level on utilization of insecticide treated nets. Therefore, additional data collection using qualitative tools could better explain this phenomenon.

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Corresponding author
Sathirakorn Pongpanich can be contacted at: gingsath@yahoo.com