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EXAMINING PERCEPTION LEVELS ON UPTAKE OF INSECTICIDAL TREATED NETS AMONG PREGNANT WOMEN IN TANZANIA

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ABSTRACT

This paper examined perception levels on uptake of Insecticidal Treated Nets (ITNs) in selected regions of Tanzania. Study objectives included: 1. To examine knowledge about malaria and ITNs among PW 2. To identify attitudes and beliefs towards relevance of ITNs in malaria control among community members 3. To examine practices in use of ITNs. Data was collected through questionnaire administration, Focus Group Discussions (FGDs), in-depth interviews and field observation. SPSS was used to analyse numerical data from the questionnaire while content analysis was used to analyze data from FGDs, in-depth interviews and observation. Findings indicates that most PW are aware of severity of malaria, its associated dangers and its relevant prevention and treatment options. Findings also show that, some community members have false perceptions including that the use of coloured nets had the possibility of causing male impotency. Further, positive practices are being failed by false perceptions by some community members, small size bed nets, and lack of money to top up for the ITNs vouchers. More sensitization and poverty levels is required. Community engagement to uncover fundamental socio-economic and cultural issues that have proved to be stumbling blocks towards malaria control initiatives is crucial. Environmental education is highly recommended.

Keywords: Malaria, Insecticidal Treated Nets, Pregnant Women, Tanzania

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1.0 INTRODUCTION

The Anopheles *gambiae* is the major vector of Plasmodium *falciparum* in Africa and is one of the most efficient malaria vectors in the world. Malaria is the most parasitic disease in the world. The previous studies indicates that malaria is responsible for 500 million cases of illness and up to2.7 million deaths annually with more than 90% of which occurring in Sub-Saharan Africa (Breman, et al.2001). In terms of Tanzania malaria is endemic across nearly all the country, with 93% of the population living in areas where Plasmodium falciparum is transmitted (URT2007).

Conversely, Malaria is the leading cause of mobility and mortality in Tanzania (URT, 2010). Statistically, it is estimated that 100,000 malaria deaths occur annually, of which an estimated 80% are in children under five years of age. Approximately 14-18 million clinical malaria cases each year are reported by public health services. Over 40% of all outpatient attendances are attributable to malaria. By and large, the disease is responsible for more than half of deaths among children under five years of age in health facilities and up to one-fifth of deaths among pregnant women (URT, 2007).

The Tanzania National Mainland Malaria Strategic Plan (NMMTSP) had planned to reduce malaria mortality and morbidity in all regions by 25% by 2007 and by 50% by 2010. There are several supportive Malaria prevention and control strategies that include a campaign on sleeping under an ITN every night. Other malaria control strategies include early treatment of fever and clinic attendance for antenatal care.

The malaria control programs based on insecticide-impregnated bed nets are now widely advocated by WHO (Breman, 2001). The government of Tanzania (GOT) has played a great role in ensuring that PW are provided with ITNs. The President's Malaria Initiative (PMI) has supported the implementation of several policy changes. Some of these policies are expected to lead to a rapid increase of ITN coverage levels for children under five and an acceleration of a transition to long-lasting insecticidal nets (LLINs). For instance, in 2004 the GOT introduced Tanzania National Voucher Scheme (TNVS) for pregnant women. Through the TNVS, a pregnant woman receives a voucher at her first routine antenatal check-up. The voucher can be used at participating retailers for a discount. In the year 2006 the TNVS Infant Voucher was established (URT, 2010). The Infant Voucher was launched in fall 2006 for children receiving their measles vaccination at nine months of age. By August 2007, more than 900,000 vouchers had been distributed nationwide to health districts with actual redemptions at 208,676 (URT, 2007).

There a few studies so far that have examined perceptual issues related to malaria and ITNs. Most such studies have indicated that there is a diversity of false perceptions towards the link

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between malaria and mosquito bites. Minja *et al* (2001) reports that "Most people see *maleria* (malaria) as a mild illness that is very common and can easily be treated but not prevented. Hence using mosquito nets is considered desirable for mosquito nuisance protection but not for *maleria* (malaria) prevention" (p.616). Findings by Minja *et al* (2001) indicates that in Kilombero valley the biomedical concept of malaria simply mean mild malaria and was directly linked to mosquito bites, local understandings of severe malaria on the other hand differed from the biomedical concept and were not linked to mosquitoes or malaria. Evidently, the information is reach on how far the efforts towards malaria control are being taken by the government of Tanzania especially to protect the most vulnerable i.e. PW and the under fives, distribution of insecticidal treated nets (ITNs) as well as sensitization campaign on sleeping under ITN every night being one of such efforts. It is also evident from the literature that ITNs programs has been proved to work in several parts of the world However, as Lengeler & Snow (1996) put it "....more research is needed on the effectiveness of ITNs under real life conditions where social, cultural and economic factors influence routine use and regular retreatment of nets (p. ii)".

Likewise Belay and Deressa (2008) found that household ownership of ITNs and their use by pregnant women in Ethiopia is promising with the current efforts to scale-up ITNs implementation, but the gap between ownership and use remains high where only about half of the population owning mosquito nets had slept under it a day before the survey. Belay and Deressa added that incorrect knowledge of the relationship between mosquito bites and malaria has been one of the major factor against poor use of ITNs in Ethiopia. In Burkina Faso free distribution and public awareness campaigns increased the rate of use of ITNs; however, this increase declined after several months post campaigns. The reasons were a combination of the community representation of malaria, the perception of the effectiveness and usefulness of ITNs and also the manner in which households are organized by day and by night.

Evidently most literature invites for studies on perceptions towards malaria and use of ITNs since most literature portrays that there is no guarantee that distribution of ITNs is inversely proportional use of such ITNs. Furthermore the literature have indicated that every society has different perceptions of the disease (its causes, prevention approaches and cure) hence specific approaches would be required to address particular issues in a specific community. to an information gap on perception levels on malaria and uptake of insecticidal treated nets (ITNs) hence the thrust of this study. The study had the following specific objectives:

1. To examine knowledge about malaria and ITNs among PW in the study areas
2. To identify attitudes and beliefs towards relevance of ITNs in malaria control
3. To examine practices in use of ITNs in the study area.

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2.0 METHODOLOGY

The study was conducted in two regions, namely Mwanza, and Mara, representing the lake zone. The regions were purposefully selected because they had highest prevalence of malaria in the Lake zone (other than Kagera with 41.9%) with 30.3% and 31.4% in Mara and Mwanza respectively (NBS & ORC Macro, 2008). For Mwanza region a sample survey was carried out in Misungwi and Magu districts whereas for Mara a sample survey was carried out in Bunda and Musoma Rural districts. The four districts were purposively selected based on recommendations from experts in malaria control surveys in the regions. In all study regions, the urban districts were purposively excluded as they were well equipped with variety of quality health facilities. In addition, the urban areas had relatively more access to RCH facilities compared to rural areas. Furthermore, the literature indicated that the uptake of malaria interventions such as ITNs remain considerably lower in rural (23%) versus urban (50%) areas (URT, 2007).

The study adopted an exploratory research design. Data was collected using a semi structured questionnaire, interview with key informants as well as field observation. Multi stage sampling was adopted to select respondents for the questionnaire where purposive sampling was used to select pregnant women who were thereafter randomly selected using simple random sampling technique. Key informants as well as members for FGDs were randomly selected from heads of households, traditional leaders, health workers as well as government leaders from district to village levels. Data collected using the semi structured questionnaire were processed using SPSS software with which descriptive statistics were carried out. Content analysis was used to analyze data from FGDs, interviews with key informants as well as observation.

3. 0 FINDINGS AND DISCUSSION

3.1. Knowledge by PW about malaria and ITNs aspects

Table 1 shows that Majority of PW(99.2%) are aware of a diseases called malaria. The table further indicates that most PW do visit Antenatal Clinics (ANC) to know their health status(99.4%), get counseling on pregnancy issues (98.9%), free malaria treatment (98.9%) and to qualify for ITN voucher (99.1%). The findings suggest that awareness about malaria is of high levels among PW. The findings on Table 1 further show that most PW (94.6%) are in agreement that it is by rule to show up at ANC.

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Table 1: PW Knowledge on malaria and ITNs aspects

SN	Knowledge attribute	Percentage (n=398)			
		Yes	No	Don't know	Not responded
1	Whether PW is aware of a disease called malaria	99.2	0.8	00	5.0
2	Whether PW visits ANC to know her health status	99.4	0.3	0.3	18.3
3	Whether PW visits ANC to get counseling and advice on her pregnancy issues	98.9	0.7	0.4	27.3
4	Whether PW visits ANC to get free malaria treatment/medicine such as SP	98.9	0.5	0.5	51.2
5	Whether PW visits ANC to qualify for voucher for ITNs	99.1	0.4	0.4	39.5
6	Whether PW visits ANC because it is required so by the governing rules	94.6	1.8	3.6	85.1

Table 2 indicates that majority of PW perceive body pain/malaise as major symptoms of malaria (71.6%) followed by high body temperature (21.6%). The other malaria symptoms such as vomiting are perceive by very few respondents (0.6%) to be symptoms of Malaria. Furthermore 1.4% of all respondents indicated that they did not know any symptom of malaria. These findings suggest that majority of the respondents are aware of at least one or two symptoms of malaria. However, the fact that most of them were not aware of such symptoms as high body temperature and vomiting suggest that there is still a need for awareness campaigns to ensure that all malaria symptoms are well understood by PW (and the general public) in the study communities. Likewise that 1.4% of respondents who indicated not to be aware of any symptoms of malaria ignored dilute efforts against malaria control efforts in the future.

Table 2 further shows that the best malaria prevention option perceived by respondents is use of mosquito nets (71.5%). However, keeping environment clean received low rates of those who perceived it being best means of preventing and controlling malaria (5.5%); this is surprising since keeping environment clean is widely acknowledge in the existing literature as an effective approach towards malaria control (see for example Randell *et al.,* 2010; Lindsay *et al.,* 2004a; and Lindsay *et al.,* 2004b). Such cleaning environments, clearing vegetation and draining stagnant water around homes is universally accepted for reducing mosquito populations and hence malaria control (Lindsay *et al.,* 2004a). The findings therefore suggest that more education is required as far as malaria prevention is concerned in the study area.

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Premature delivery/miscarriage (27.9%) was perceived the most common risk factors of malaria followed by death (24.3%) and anemia (21.4%). As far as malaria treatment options is concerned majority of the respondents indicated to be aware that use of SP (37.2%) followed by Alu (*dawa mseto*) (39.2%) would lead into proper treatment of the disease.

Table 2: Knowledge on malaria symptoms, prevention, treatment and associated risk factors

SN	Knowledge attribute	Response (%) n=398
1	Most Common symptoms of malaria	
	1. Body pain/malaise	71.6
	2. High body temperature	21.6
	3. Vomiting	0.6
	4. Others	9.8
	5. Don't know	1.4
2	Most common malaria prevention options	
	1. Mosquito coil/spray	2.5
	2. Mosquito nets	71.5
	3. Keeping environment clean	5.5
	4. Others	19.1
	5. Don't know	1.3
3	Most common risk factors of malaria	
	1. Death	24.3
	2. Anemia	21.4
	3. Jaundice	0.3
	4. Congenital malaria	2.1
	5. Premature delivery/miscarriage	27.9
	6. Mental disorder/very high fever	10.7
	7. Others	8.7
	8. Don't know	
4	Most common malaria treatment options	
	1. SP	37.2
	2. Alu (*dawa mseto*)	39.2
	3. Quinine	6.3
	4. Pain killers/paracetamol	2.0
	5. Chloroquine	0.8
	6. Amodiaquine	5.5

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	7. Don't know	8.0

3.2 Beliefs and attitudes towards relevance of ITNs

Table 3 reveals that generally most PW has the right beliefs regarding relevance of ITNs. Over 88% of all respondents, for example believe that ITNs provide effective prevention for malaria. As it was stated earlier, majority of the respondents did not agree with the statement that Malaria is better prevented by spraying insecticides than use of ITNs hence that supports their perception that ITNs provide effective prevention for malaria. However, Table 3 also shows that almost half of all respondents were of the opinion that Many PW would resist to pay a nominal fee (Tsh 500.00) for ITNs. The findings are in line with data from GFDs which indicated that one of the challenges towards access to ITNs was lack of money. This suggests high levels of poverty in the study communities. Likewise, findings on Table 4 indicates that most respondent were farmers and house wives; this suggests that most respondents are of low income categories.

Table 3 further reveals that majority of the respondents (over 90%) appreciates efforts by the government towards malaria control as they were in agreement with the statement that "The government is very supportive of PW to obtain ITNs". Likewise, most respondents (over 90%) have positive perception towards services provided by RCH staff as they noted that such staff provide very friendly counseling to PW. In some cases, PW were travelling more than five kilometers from their homes to the ITNs vendors.

Table 3: PW Beliefs and Attitudes towards relevance of ITNs

SN	Belief/Attitude attribute	Response (%) Sample N= 398				
		Strongly disagree	Moderately disagree	Don't know	Moderately Agree	Strongly agree
1	ITNs provide effective prevention for malaria	2.8	3.3	4.3	34.7	54.9
2	Malaria is better prevented by spraying insecticides than use of ITNs	31.6	16.7	21.0	21.5	9.1
3	Many PW resist to pay a nominal fee (Tsh 500) for ITNs	23.4	12.4	15.2	29.7	19.3
4	The government is very supportive of PW to obtain ITNs	3.8	1.8	2	21.5	71.1
5	RCH staff provide very friendly counseling to PW on use of ITNs	2.5	3.8	1.0	17.3	75.4

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Key informants in the study villages revealed wrong perception on the relevance of ITNs. These perceptions include the fear that the ITNs are connected with family planing initiatives including male sex malfunctions. Other falsehood was associated with blue colors of the nets provided. It was observed that historically, the common mosquito nets in the country have always been manufactured in white colors except the army ones. The provision of blue colored mosquito nets was somehow strange to the users.

Table 4: Respondent's occupation

			District				
			Bunda	Musoma Rural	Misungwi	Magu	Total
Respondent's occupation	Civil servant	Count	4	4	3	3	14
		% within District	2.9%	4.2%	6.0%	2.7%	3.6%
		% of Total	1.0%	1.0%	.8%	.8%	3.6%
	Farmer	Count	67	59	25	80	231
		% within District	49.3%	61.5%	50.0%	72.7%	58.9%
		% of Total	17.1%	15.1%	6.4%	20.4%	58.9%
	Trader	Count	13	6	1	4	24
		% within District	9.6%	6.2%	2.0%	3.6%	6.1%
		% of Total	3.3%	1.5%	.3%	1.0%	6.1%
	Housewife	Count	52	27	21	23	123
		% within District	38.2%	28.1%	42.0%	20.9%	31.4%
		% of Total	13.3%	6.9%	5.4%	5.9%	31.4%
Total		Count	136	96	50	110	392
		% within Respondent's occupation	34.7%	24.5%	12.8%	28.1%	100.0%
		% within District	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	34.7%	24.5%	12.8%	28.1%	100.0%

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3.3 Practices in use of ITNs in the study area

The researchers observed inappropriate usage of provided bed nets. Some were using the bed nets to protect their vegetables against insects. In a more interesting case the net was used as building material to protect the grass made toilet; see for example two photographs below showing ITNs misuse. The photographs were taken from one of the study villages. From these photographs it can be deduce that the nets were either too small to fit in the family beds or were distributed without considering the actual needs as revealed during FGDs. The some of the interviewees commented that they were using nets for chicken keeping, protection of vegetables and fishing.

Photographs showing misusage of LLINs

Source: Field data (2014)

Furthermore, it was learnt from interviews with key informants that the sizes of provided ITNs were not appropriate for family use. The interviewees expressed that the families both in rural and urban areas had no separate bed for each family member. Normally the fathers, mothers and children under five years use single big beds (from 4x6 to 6x6 feet). Also, it was learnt that the provided nets were of small size in comparison to the dimensions of most beds in use. This explains that most families had beds with completely different sizes to the provided nets. It was later learnt through probing questions that there is a big possibility that wrong information was provided during the initial survey before provision of the bed nets. One of the interviewee

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strongly argued that it was not possible for the survey to reflect the actual bed sizes as most African traditions do not provide for strangers to inspect the bedrooms as it was associated with the taboo and superstitious reasons.

Findings from FGDs show that sensitization on the use of bed nets should go beyond such groups of people as pregnant women which are the mostly focused on by the government at the moment. The discussant suggested that there is a need to involve husbands and influential local leaders. It was learnt that local leaders had great influence in increasing awareness of the use ITNs. During the interviews it was repetitively observed that the community members placed great respect to their chiefdoms. The discussants recommended public meetings as the most appropriate tool to sensitize PW on use of ITNs. In one case, the discussant mentioned a case where the husband decided to confiscate the net provided under TNVS. The discussants suggested that other household members should be included in the subsidized ITNs.

Moreover, the discussants cautioned that the public meeting and training programs should take into consideration the farming seasons. The follow up questions with health personnel in almost all study villages indicated a drop of women attendance in the clinics during the growing and harvesting seasons.

4.0 CONCLUSION

It is evident from the findings that there is positive knowledge, beliefs and altitudes towards malaria as well as ITNs among most PW in the study area. However Practices on use of ITNs are failed by such factors as poverty and pressures from other social groups such as husbands and religious leaders. The findings therefore suggests that awareness rising should involve the whole community not only PW and women with children under five; such awareness raising activities should go hand in hand with studies aiming at uncovering fundamental socio-economic and cultural issues that are likely to be stumbling blocks towards behavioral change for malaria control initiatives. One of the economic issues has been lack of money which has been reported as one factor that also fails practices towards use of ITNs. But it should be remembered that malaria costs lives and wealth, and to make things worse, where the disease thrives economies also suffer (Lindsay *et al.,* 2003). There is a need to conduct a study that will come up with objective findings on levels of poverty in the society and how such levels are likely failing efforts towards malaria control especially use of ITNs. It was also revealed that not all LLINs distributed to PW was used for the purpose of malaria control rather some nets were used for different purposes altogether. Misuse of ITNs was associated by the ITNs to be not of appropriate size required by families i.e. most nets were relatively too small compared to bed sizes. This is another reason why a study to uncover social, economic and cultural issues is

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important as it will address some of such issues. The issue of husbands confiscating ITNs from PW for their own use could be associated to socio-economic and cultural issues that are yet to be uncovered hence a necessity for further studies to deal with such socio-economic and cultural issues. It could be that, one, men have no money to afford for their own mosquito nets; two, it could be that men showing off masculinity against women etc. But more importantly, for malaria control to be more successful, every member of the family need to be protected against the pandemic. Gerry *et al.,* (2007), for example, explains that high but exclusively targeted coverage of young children and pregnant women delivers limited protection and equity for these vulnerable groups, in contrast, relatively modest coverage of all adults and children, rather than just vulnerable groups, can achieve equitable community-wide benefits equivalent to or greater than personal protection. This means that although the use of ITNs by vulnerable groups should remain a priority yet wide-scale ITN use by the entire population should also be promoted.

Majority of the people in the study area do not perceive that keeping environment clean is one approach towards prevention of malaria; this need to be addressed since prevention of malaria through keeping the environment properly would be the most sustainable approach towards malaria control. Lindy et al., (2003) noted that In the early 1900s malaria was controlled in many parts of the region using environmental management (EM) for vector control. EM is where the environment is modified or manipulated to reduce malaria transmission by attacking local vector mosquitoes and requires an understanding of the ecology of these species. Today malaria control is based on drugs and insecticides, but their sustainability has been undermined by the development of resistance and growing concerns about the long-term environmental impact of some insecticides. EM would strengthen malaria control activities and be cost-effective. But also the timing for awareness campaigns need to observe calendars for important economic activities as it is evidenced by the findings that particular seasons especially those associated by agricultural activities need to be avoided as people have no time for other activities other than farming.

Generally, removing preconceived ideas such as sex malfunction myth against net colors; perking up knowledge on the malaria symptoms, preventions and treatment; provision of quality nets, poverty alleviation and environmental education are still required to enhance malarial control initiatives in the study area.

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