



## A review on factors influencing the adoption of Malaria preventive practices among pregnant women in sub-Saharan Africa

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### ABSTRACT

Malaria is highly endemic in sub-Saharan Africa and is associated with serious consequences in pregnant women. The World Health Organisation as a result, prescribes for pregnant women in the region, the use of Insecticide Treated Nets (ITN) and Intermittent Preventive Treatment (IPT) with Sulphadoxine-Pyrimethamine (SP). However, adoption of these practices has been generally low among pregnant women in the region. This paper aimed to explore factors influencing such practices among pregnant women in the region. Socio-demographic factors like age; level of education; employment; family type and obstetric factors, like parity and gestational age, were important factors significantly associated with the adoption of these protective practices. Many socio-cultural and logistics factors were also reported to have great influences on the women's level of adherence. These included negative beliefs like: belief that the pills were toxic or that the chemicals with which the nets were treated are toxic and belief that these measures were not effective in preventing malaria infection. Also, logistic factors like availability of SP, drinking water and cups at the health centres; giving IPT under direct observation; and even the attitude of the health workers towards their clients were identified as important predictors of good compliance. Level of personal motivation also seemed to be an important factor as many stated reasons such as discomfort and heat as their reasons for not sleeping under nets. Social motivation especially the husband's support was an important predictor of compliance with IPT. Results of this study point out to the need for massive public awareness on the dangers of malaria in pregnancy and the safety and important protective roles of ITNs and IPT.

#### Keywords:

Malaria prevention, Pregnancy, Associated factors, Intermittent Preventive Treatment (IPT), Insecticide Treated Net (ITN)

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## 1. Introduction

Malaria remains a serious threat to pregnancies in sub-Saharan Africa [1]. It is associated with a number of complications which include maternal anaemia [2-5], low birth weight [6-10], abortion [11], pre-term delivery [6], stillbirth [12] infant mortality [13] and maternal mortality. Several effective measures like Indoor Residual Spraying [14] and the use of mosquito coils [15] exist for malaria prevention and control. The World Health Organisation (WHO) however, recommends for all pregnant women in sub-Saharan Africa, the use of Insecticide Treated Nets (ITN) and Intermittent Preventive Treatment (IPT) with at least two doses of Sulphadoxine-Pyrimethamine (SP) [1]. However, despite these recommendations by the WHO, the adoption of these practices by pregnant women in this region remains poor [16-22].

Understanding why these women still have a poor compliance to these practices is central to the planning and implementation of health promotional interventions among this group. The objective of this study is to explore the factors associated with the adoption of malaria preventive practices among pregnant women in sub-Saharan Africa.

## 2. Materials and methods

A detailed literature search was conducted in Google scholar; PubMed and the Cochrane library. Search terms included: malaria prevention; pregnancy; intermittent preventive treatment (IPT); insecticide treated nets (ITN); associated factors; reasons for non-use. Titles and abstracts of the resulting articles were screened to determine their suitability for inclusion. Only articles published from the year 2000 onwards, were included in this review. In the reporting of factors as either significant or not, results from multivariate analyses were used.

## 3. Results

A total of thirty-one published articles were selected for inclusion into this study; all of which were original research papers. Factor influencing the adoption of these practices were classified into socio-demographic; obstetric and gynaecological; socio-cultural and logistic factors.

### 3.1 Socio-demographic factors associated with ITN use

A study among pregnant women in Abuja, Nigeria revealed a statistically significant association between ITN ownership and its use [23]. Not having a net was also stated by some women as their reason for non-use [22]. A survey from demographic data of African countries revealed a higher proportion of ITN use among women in households with universal net coverage compared to those in households with at just one net [24]. In 2008, [22] reported among pregnant women in Kinshasa, Democratic Republic of Congo about three times higher chances of ITN use among those with at least a secondary school education similar to a later study in Zambia, which revealed a better ITN use among pregnant women who had some monthly income and those who had at least a secondary school education [25].

Contrasting findings have also been reported by [26], of decreasing ITN use with increasing level of education and wealth [26]. It has also been shown that in Jinji, Uganda, women in the wealthiest households were less likely to always sleep under an ITN [27]. In Ethiopia, those who had bought their ITNs were twice more likely to use them compared to those who had received them for free

[28]. However, no significant association with ITN use was reported for educational status; age; ethnicity and occupation among pregnant women in Azare, Nigeria [29].

### *3.2 Obstetric and gynaecological factors associated with ITN use*

In the Central African Republic, multigravid women were less likely to use ITNs compared to primigravid women [25]. Higher gravidity was significantly associated with sleeping under ITN among pregnant women in south-western Tanzania [30].

### *3.3 Socio-demographic factors associated with adherence to IPT*

Among pregnant women in Bangui, Central Africa, those with at least a secondary school education were twice more likely to be compliant with IPT; while those with some form of income were four times more likely compared to those with no income at all [25]. Educational attainment of not more than nine years was a predictor of non-usage of IPT among pregnant women in two health facilities in Ibadan, Nigeria [31]. Those who were attending maternal and child health education sessions were twice more likely to use IPT [32].

Among pregnant women in Ibadan, Nigeria those who were married in monogamous settings; those with good formal education and those who were dependents were more likely to use ITNs compared to their counterparts who were married in polygamous settings; those with little or no formal education and those who were employed respectively [33]. Among pregnant women in Zambia, there was no significant association between age, educational level, occupation, religion and distance to health facility with IPT adherence [34]. Similarly, in a rural town in western Nigeria, educational level, age group and occupation were not associated with IPT adherence [35].

### *3.4 Obstetric and gynaecological factors associated with adherence to IPT*

Advanced maternal age; higher parity; lower gestational age at booking and ITN use were significantly associated with IPT adherence among women attending Primary Health Care clinics in Kano for their ante-natal care [36]. In contrast, multigravid women with at least three pregnancies were more likely not to receive the recommended IPT regimen in Blantyre, Malawi [37]. The period of pregnancy during which the first dose was received also seemed to be important, as a four-fold higher level of adherence was reported among those who had received their first dose at 4-6 months of gestation in Zambia [34]. However, early booking and history of adverse pregnancy outcome(s) were not significantly associated with adherence to IPT among women in a rural area in Western Nigeria [35].

### *3.5 Socio-cultural and logistic factors affecting Malaria preventive behavioural practices*

Pregnant women in sub-Saharan Africa have cited numerous reasons for not using ITNs and not complying with IPT-SP. In Kinshasa, some women stated not having a net and that there were no mosquitoes in their area as their reasons [22]. In Abuja, many pregnant women stated discomfort due to heat; fear of suffocation; and non-acceptability of its use by their husbands as reasons for not using ITNs [23]. In [29], many also gave the same reasons of heat and poverty for not using ITNs. In a secondary health centre in Ibadan, the reasons they gave for non-adherence were forgetfulness; that they were given the drugs only once; fear of adverse effects of the drug and singular visit for ante-natal care [38]. In Imo state, fear of possible toxic effects to the pregnancy from the chemicals

embedded in the nets, high cost of the ITNs and low use of ante-natal care were mentioned as factors affecting the use of ITNs by some pregnant women [39].

[40] reported in a study in Ekitti, Nigeria, that 41.8% stated that they had never thought of it; 32.1% said they do not consider it important; while 8.0% said it is not their culture [40]. Among households in Ethiopia, not considering malaria to be a serious problem; only a few mosquitoes around; and their ITNs being in poor conditions were stated as reasons for not using nets [28]. In Mukono district, Uganda, pregnant women cited high cost of the ITNs; fear of suffocation; heat; and fear of toxic effects of the chemicals with which the nets had been treated as reasons [41]. In Lagos, some mentioned difficulty in treating the nets and already having nets on their doors and windows as reasons for not using ITNs [42].

Many of the pregnant women had stated 'not being sick' as their reason for their non-adherence to IPT [43]. In Ekitti, some pregnant women expressed fears of possible adverse effects of IPT on their pregnancies [44]. In two health facilities in Ibadan, most of the non-users gave no reason for not complying with IPT [31]. In a nation-wide survey among pregnant women in Nigeria, not holding any misconceptions on malaria prevention and having the knowledge that ITN protects against malaria were significant predictors of ITN use [45].

As recommended by WHO, IPT should be taken under direct supervision of a health care personnel at a health centre. This however, has not been the case in many instances, as reported among pregnant women attending Primary Health Care clinics in Kano, that only 36.8% of them had taken their pills under supervision [36]. Many women who had been given their pills to take at home had testified to throwing them away after leaving the health centres [46]. Also, women in some districts in Tanzania stated long waiting times at the clinics and having to share cups with others when taking their IPTs as part of their reasons for non-uptake [47]. Other reasons mentioned include: not given other doses by the staff and late booking [34]. Also, clients who perceived the attitudes of health workers as 'good' were also reported to be more likely to adhere to their IPT regimen SP regimen [34].

A study in a health centre in Bukoba, Tanzania where IPT coverage was very high (96% for at least one dose and 86% for at least two doses) revealed early ante-natal care booking and the availability of SP at the health centres as important predictors of its use [48]. Availability of SP at the antenatal care centre was also a predictor of use in Lusaka, Zambia [49]. Among pregnant women in a rural population in Northern Ethiopia, lack of access to nets and perception that nets could not protect one against malaria were significantly associated with ITN non-use [50]. Haven had greater than three ante-natal care visits was a significant predictor of IPT use among women in Juba, South Sudan [51]. Knowledge of IPT was a significant predictor of return for subsequent doses after the first among pregnant women in the Bosomtwe District of Ghana [52].

#### 4. Discussion

Contrasting results have been reported on the association between socio-demography and ITN use. Net ownership obviously appears to be a requisite for using it, as reported by [43] and could be the reason for a higher use among those with some level of income due to their ability to own one. The contrary is however likely to be seen among those in the very high income strata who may see net use as 'retrogressive' due to their accessibility to more sophisticated measures of avoiding mosquito bites or believe that mosquitoes do not have access to them.

Those who bought their nets were likely to have done so out of high motivation and were as such more likely to be using it. Some reasons cited by some women for not using ITNs, such as heat and discomfort, further buttress the point that malaria is generally not considered to be a serious health

and life threatening illness in sub-Saharan Africa. Heuristics like toxicity of the insecticides on ITNs and toxicity of IPT show the role massive public enlightenment is likely to play in promoting ITN and IPT use. They need to be made aware of the safety of these protective measures. Awareness campaigns should not focus solely on the pregnant women but also their spouses, due to the important role they play as revealed in a study in Blantyre, Malawi that next to the health workers, husband's support was the most important motivating factor to taking IPT [53].

That many women received only a single dose of IPT because it was given to them only once or due to singular ante-natal care visit, points out the need for raising awareness on the importance of starting ante-natal care early in the pregnancy and complying with their appointments. Health workers at the ante-natal units should also ensure that IPT medications are taken under their direct observations at the health centre and should tailor their clients' appointment dates so that they are able to receive the minimal two doses prescribed by the WHO. Giving IPT directly observed would hopefully be effective in plummeting the problem of forgetfulness and those who throw away their pills after leaving the centre.

Health education on malaria prevention should also be incorporated into the routine health education given at ante-natal clinics in malaria endemic regions. The design and implementation of health promotion interventions should bear in mind the peculiar characteristics of the target population since as we have seen, same factors could influence practice differently for different populations. A better understanding of these factors and how they work could be achieved by conducting more structured interviews in this regard [54].

## 5. Conclusion

This paper presents a comprehensive review of factors influencing the adoption of malaria preventive practices among pregnant women in sub-Saharan Africa. These factors could be broadly categorized as socio-demographic; obstetric and gynaecological; socio-cultural and logistic factors. Efforts need to be put in place to increase both personal and social motivation through awareness campaigns; and also to improve service delivery at health centres.

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