A Socio-Ecological Approach To Understanding The Factors Influencing The Uptake Of Intermittent Preventive Treatment Of Malaria In Pregnancy (IPTp) In South Western Nigeria.

Gertrude Nsorma Nyaaba
The University of Sheffield Faculty of Medicine Dentistry and Health https://orcid.org/0000-0002-1113-3832

Atinuke O Olaleye (olaleyea@babcock.edu.ng)
https://orcid.org/0000-0003-4935-3926

Mary O Obiyan
Obafemi Awolowo University Faculty of Social Sciences

Oladapo Walker
Babcock University Benjamin S Carson Senior School of Medicine

Dilly OC Anumba
The University of Sheffield Faculty of Medicine Dentistry and Health

Research article

Keywords: Malaria in pregnancy, health behaviour, health promotion, IPTp, ITN use, rural communities, TBAs, health systems, sub-Saharan Africa

Posted Date: July 27th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-40304/v1

Version of Record: A version of this preprint was published at PLOS ONE on March 15th, 2021. See the published version at https://doi.org/10.1371/journal.pone.0248412.

Abstract

Background: Malaria in pregnancy (MiP) remains a key cause of poor maternal and neonatal health outcomes. Two key strategies globally promoted to address MiP require pregnant women in malaria-endemic regions to sleep under insecticide-treated bed nets (ITNs) and take at least three doses of intermittent preventive treatment (IPTp) during pregnancy. Particularly in the African region where weak health systems grapple with prevailing socio-cultural and traditional practices, several multilevel factors influence the effective uptake of these strategies. This study explores the factors for the poor uptake of IPTp and use of ITNs in lower socio-economic communities in Nigeria.

Methods: We conducted semi-structured interviews (SSI) and focus group discussions (FGD) with a total of 201 key stakeholders in 6 communities in Ogun State, South-western Nigeria. Twelve SSIs were conducted with traditional birth attendants (TBAs), faith-based birth attendants and healthcare providers operating in public health facilities. Community leaders (7), pregnant women (30) and 20 caregivers were also individually interviewed. Sixteen FGDs were conducted with multi- and first- time pregnant women grouped by location and pregnancy experiences. A thematic approach were used for data analysis.

Results: At the individual and social levels, there is high general awareness of MiP, its consequences and ITNs but a low awareness of IPTp, with type of antenatal care (ANC) provider being a key factor influencing access to IPTp. Choice of type of ANC provider, which facilitates access to IPTp and ITNs, is influenced by experiences of relatives with ANC providers, attitudes of ANC providers and community perceptions of the type of ANC providers. Concurrent use of multiple ANC providers and ANC providers' relationships further influence acceptability and coverage for IPTp and ITN use. At the health sector level, there is low awareness about preventive malarial strategies including IPTp among TBAs and faith-based birth attendants, in contrast to high IPTp awareness among public healthcare providers.

Conclusion: The findings highlight several factors that influence the utilisation of IPTp services and call for greater synergy and sensitisation between the three groups of healthcare providers towards improving access to and acceptability of IPTp for improving maternal and child outcomes.

Background

Malaria prevention remains a key public health challenge, with malaria in pregnancy (MiP) accounting for an estimated 15% of global maternal deaths in 2015 (1). About 94% of the estimated 405 000 global malaria deaths in 2018 occurred in the African region, with malaria reported as the third commonest cause of death among women of reproductive age in sub-Saharan Africa (SSA)(1–3).

The World Health Organisation (WHO) recommends that in addition to sleeping under insecticide-treated nets (ITNs), starting from the second trimester of pregnancy, pregnant women in endemic regions should take at least three doses of intermittent preventive treatment in pregnancy (IPTp) to prevent malaria (1). Evidence shows that IPTp with sulfadoxine-pyrimethamine (SP) reduces maternal anaemia, low birth weight, and perinatal mortality (1). Yet, coverage and utilization of IPTp remains sub-optimal in SSA with about 40% of pregnant women not sleeping under an ITN and over 60% not receiving the recommended three or more doses of IPTp in 2018 (1–3). Operating within the context of weak health systems grappling with the heaviest burden of malaria and the highest global maternal and perinatal mortality rates, uptake of IPTp and use of ITNs is crucial for improving maternal and perinatal health outcomes.

Nigeria, the most populous SSA country, contributed 24% of the estimated global malaria deaths in 2018 despite adopting the policy of free distribution of ITNs (2001) and IPTp (2004) as MiP intervention strategies (1, 3). Under these policy directives, pregnant women receive ITNs freely and IPTp is institutionalised as a no-cost directly observed therapy (DOT) at antenatal clinics (ANC) in public health facilities and at health facilities managed by non-governmental organisations (4). Yet, in 2018, only about 20% of pregnant Nigerian women attending ANC received at least three doses of IPTp-SP (3). The

Nigerian Demographic and Health Survey 2018 (NDHS) shows that 58% of pregnant women had slept under an ITN the preceding night and while about 57% of women attended four or more ANC visits, only 17% of women with a live birth in the last two years had received at least three IPTp doses (5). A few studies have shown some health system and individual factors (4, 6) as key contributors to the low uptake of ITN and IPTp in Nigeria. However, there is scant evidence on how interpersonal, societal and provider related factors contribute to the poor uptake of ITNs and IPTp, particularly in rural and lower socioeconomic communities where social and communal norms are most influential. This is relevant as Nigeria operates a pluralistic health sector with about 60% of Nigerians seeking private health care (7, 8). Traditional Birth Attendants (TBAs) and faith-based birth attendants, as key parts of the private health sector, provide a significant amount of ANC services (9, 10), especially in rural and lower socio-economic communities. These peculiarities have crucial implications for access to and utilisation of ITNs and IPTp in such environments.

Using elements of the socio-ecological model (SEM), this study explores the factors contributing to the poor coverage of IPTp within a pluralistic health sector in Ogun State, southwest Nigeria. As a theoretical framework, the SEM recognises that peoples' health behaviours are embedded within larger interactive and overlapping social systems which influence health outcomes (11). It thus presents an apt framework for exploring the intricate multi-layered factors within the social system that shape pregnant women's acceptance and utilisation of interventions for the prevention of MiP.

Methods

Study design: This was a multi-site cross-sectional qualitative study, using semi-structured interviews (SSI) and focus group discussions (FGDs) to collect primary data from 201 participants in six semi-urban and rural communities in Ogun state between February and March 2019. Initial study questions which guided data collection were developed using grounded theory (12, 13) as part of a larger study on determinants of malaria prevention during pregnancy in Ogun state, Nigeria. Conducted following the consolidated criteria for reporting qualitative research (14) (Supplementary file 1), all data was collected as digitally recorded audio files by 14 Research Assistants (RAs) with at least two years contextual research experience. The authors developed the topic guides used in collecting the data based on existing literature on MiP interventions in Africa and Nigeria specifically and drawing on their own conceptual experiences working in maternal and child health issues in the study areas. Interviews and discussions were conducted in private locations, usually identified by the participant(s) at his/her convenience on a scheduled date after verbal and written/thumb printed consent was sought from each participant. Ethical approval for the study was received from the Ethics Review boards of Babcock University (BUHREC056/19) and the Ogun State Ministry of Health (HPRS/381/290). The research team had no prior contact with study participants.

Methods: SSIs were used to explore in-depth perceptions and experiences regarding uptake of ITN and IPTp in six rural and semi-urban communities in Ogun West, Central and East districts. We purposively selected public healthcare providers (4), TBAs (4) and faith-based birth attendants (4) based on popularity and accessibility within selected communities, to explore access and awareness surrounding IPTp in a pluralistic health sector. We further purposively contacted community leaders (7) and caregivers, mainly, family members (20), through participating pregnant women (30), to enable us to explore the influence of community and family networks on IPTp access and uptake. SSIs were conducted in the local language (Yoruba) and/or English with each interview ranging from 30 to 65 minutes.

Sixteen FGDs were conducted with 132 pregnant women attending ANC, grouped by location and ANC provider (TBA, faith-based birth attendants and public healthcare providers) to gain insights into their collective pregnancy experiences with malaria prevention strategies. RAs recruited seven to 11 pregnant women at ANCs for FGDs with discussion time ranging between 40 to 76 minutes. Study information was given verbally and information sheets clearly outlining the purpose of the research presented to participants. Two trained RAs moderated the discussions in the local language using a topic guide and took notes.

Data Analysis: Because of the iterative nature of the study, data collection, translation, transcription and analysis were concurrent to enable the exploration of emerging themes. Six native speakers transcribed digitally recorded interviews and discussions into Yoruba, which were then translated into English. Co-authors reviewed all transcripts and translations to ensure the quality and accuracy of the translation. Transcripts were not returned for participant cross-checking due to low literacy rates. The initial coding framework was generated in QRS Nvivo 11 pro by the first three authors using pre-identified themes derived from the initial topic guide with emerging themes subsequently coded in constant comparison and reviewed for contextual relevance. Patterns and linkages between quotes, codes, themes and existing literature were explored in-depth to identify areas of convergence and divergence.

Results

Table 1 provides the background characteristics of all study participants.

Malaria in pregnancy

Perceptions regarding MiP

MiP was perceived as common during pregnancy, with adverse outcomes such as miscarriages, premature births, impaired foetal growth and development and neonatal deaths. A few pregnant women attending TBA clinics held the view that pregnant women do not get malaria. On the consequences of untreated MiP, both public and private healthcare providers emphasised delivery complications while pregnant women and caregivers emphasised the fear of new-borns developing measles, typhoid fever, jaundice and convulsions. Personal and social network experiences were commonly reported among pregnant women, caregivers and community leaders as the key sources of information for preventing and treating MiP.

"Pregnant women do have malaria… they don't have malaria; I have never had malaria…pregnant women are not supposed to have malaria." FGD-PW- TBA-R-01

"It can make someone give birth to premature baby…the baby might die…it can spoil the pregnancy….it can abort the pregnancy…it can cause measles on the baby… if the pregnant woman has malaria it can let the baby fall [miscarriage] because her stomach will be paining her and she might give birth early …malaria won't allow the baby to move in the stomach …it can cause convulsion for the baby, the baby might not talk or sit on time, and it won't cry and until they beat the baby before it will cry…the mother might not have the strength to push during labour." FGD-PW-PHC-R -01

"It happened to my sister, she lost a baby last year… it weakens the mother, hinders the growth of the baby… some children might have red or yellow eyes… it can make it difficult for the mother to deliver easily… if too severe, it can damage the baby's body parts, like handicapped kids, the mother, her strength might be reduced." FGD-PW-PHC-U-02

"It could kill the child and can also cause premature birth. Malaria may turn to hepatitis and cause jaundice…it could cause miscarriage and the death of the woman." SSI-TBA-01

Preventing MiP

Pregnant women, caregivers and TBAs commonly reported the practice of personal, home and environmental hygiene and the use of traditional remedies consisting of boiled leaves of pawpaw, mango and ginger as key strategies to preventing MiP. ITN use was the most commonly reported method for preventing MiP among all participants, with only public healthcare providers and a few pregnant women reporting IPTp as a MiP prevention strategy. A few pregnant women attending ANC at public health facilities reported receiving medicines for preventing MiP although the majority did not know the name of the medications. IPTp was less commonly reported by faith-based birth attendants and was not reported by any TBA. Some pregnant women and caregivers held the view that taking medications during pregnancy was good for

the health of mother and baby while several other pregnant women, caregivers and TBAs raised concerns about taking medications during pregnancy in the absence of illness.

"Avoid mosquito… malaria herbs… sleep under net... pregnant woman shouldn't be walking under sun...clean the environment…. take fansidar [SP]…… if someone should use unripe pawpaw … peel it, put the leaf and wash it, then put it inside water, in one bowl…If a pregnant woman can use it, it really works for malaria… they use it to bath… I did it with my children and they are grown up and can stand very well because of things [remedies] I used for them during their pregnancy that is working in their body" FGD-PW-PHC-U-01

"Using drugs is important but not that someone will be using it every time when nothing is happening" FGD-PW-PHC-S-01

"Most times some of those drugs can be overactive in the body so one has to be careful… I have not used drugs to prevent malaria" FGD-PW-PHC-S-02

"There are some things that are traditional that she will use to prevent malaria." SSI-CL-01

Access to and utilisation of ITNs

All participants commonly reported ITNs as freely accessible from public health facilities. Most rural dwelling pregnant women, caregivers and community leaders additionally reported periodic distribution of free ITNs by non-governmental organisations (NGOs). Pregnant women attending TBA and faith-based ANC did not report receiving ITNs from their providers, with several reporting that they accessed ITNs freely from public health facilities, NGOs, or bought ITNs from commercial sources. Only a few pregnant women who owned ITNs reported sleeping under ITNs.

"I also protect myself through the use of net every night… they gave a net me at the hospital and my mother gave me one." SSI-PW-PHC-S-01

"They didn't give us net here. You have to go to the clinic to get it." SSI-PW-TBA-S-02

"Last year, they just brought the nets here and they gave us… I think from an organization, it's every four years." SSI-PW-PHC-R–01

"we've given them mosquito nets to prevent them from malaria…They are given nets the same day they get their [registration] cards, and we orientate them how to make use of the nets." SSI-PHC-S-01

Access to and utilisation of IPTp

Nearly all participants reported that pregnant women receive medications when they attend ANC clinics, although only a few pregnant women specifically mentioned SP or its common brands (e.g. fansidar, amalar) as a preventive antimalarial. Medications like folic acid were commonly reported by pregnant women and a few caregivers as provided at public ANC clinics while herbal medicines/concoctions were provided at TBA ANC and "spiritual waters" provided by faith-based birth attendants. Some pregnant women attending TBA clinics reported being encouraged by TBAs to buy antimalarial medications from commercial sources when TBAs suspected they had MiP. Only a few pregnant women attending public ANC facilities mentioned ever receiving and/or being told they would receive IPTp three times during pregnancy. Other pregnant women reported receiving injections for the prevention of MiP although they did not know the name of the injection. Even fewer pregnant women reported taking IPTp as a directly observed therapy. Caregivers and community leaders reported that they encouraged pregnant women to take their medications when they were home, although no caregiver specifically mentioned SP for preventing MiP. No TBA and only a few faith-based birth attendants mentioned IPTp for preventing MiP. Nearly all ANC providers at public health facilities were aware of IPTp as a preventive strategy for MiP and reported providing IPTp during ANC services, with a few reporting the use of SP as treatment of MiP.

"There is a drug given to us when we go to the clinic to prevent malaria. I don't know the name but it's yellow. I think it's called "amalar" and we take it home to use… They give us drugs like "Amalar", "folic acid" to prevent malaria at home." FGD-PW-TBA-S-02

"They supply us so we give them, it's free, SP is free, so we will give them…we make them take the drugs before leaving here, we would have informed them, so they use it." SSI-PHC-S-02

"We give them IPT when their pregnancy is 16 weeks, we give them at 20 weeks, and we give them at 24 weeks. Before it was twice, but now I think it is 5 times - every four weeks, once the pregnancy is 20 weeks or 16 weeks. The IPT has a particular brand name called SP. I think there was a national guideline to prevent malaria." SSI-PHC-U-01

Factors influencing IPTp uptake and use of ITNs

Pregnant women and caregivers commonly reported side effects such as heat from the chemicals used in treating the ITNs, developing rashes and itching as reasons for pregnant women's non-use of ITNs. Difficulties in swallowing, nausea and side effects such as sweating, drowsiness and frequent urination were commonly reported by pregnant women as key reasons for their poor uptake of IPTp.

"I do feel nauseated when I take that drug at the hospital…When I use the drug, I feel weak, when I now use it, I will just sleep… Once I finish taking my drug in the morning, I fall asleep… If I take it with water, I will vomit it." FGD-PW-TBA-R-01

"The odour of the drug causes me to vomit … when I take the drug it changes the movement of the child…I feel like the baby is shifting towards my anus…"

"It [ITNs] usually causes heat. And when I first tried it then it gave me rashes, they now said because I didn't dry it out.... then I didn't even like it anymore." FGD-PW-TBA-R -01

Pregnant women reported a lack of sensitisation on malarial interventions by their ANC providers. Some pregnant women indicated that they were supposed to use the ITNs after they had delivered their babies while others reported that they did not receive any information on when and how to use their ITNs. Some pregnant women believed that the combination medications they take routinely in pregnancy are sufficient for MiP prevention so they did not take the IPTp drug when given to them to take home. Other pregnant women reported that they had difficulties swallowing drugs and hence indicated a preference for injections compared with the tablets. Most caregivers indicated that their wards reported receiving their check-ups and taking medications given to them to take at home.

"I have not used it [ITN]. I just dropped it at home. I thought we will start using it after giving birth." SSI-PW-FBF-R-02

"I use pregnant care [haematinics] so I'll collect it [SP] and leave it at home. All the drugs given to me is already in pregnant care which is 2in1..." FGD-PW-TBA-S-01

"They brought it [ITNs] but there was no lecture….we washed it because it itches the eyes, they said the chemical is not good…" SSI-PW-PHC-R-01

"I prefer injection to drug because to swallow the drug is always difficult, but injection is always fast than drugs… I will vomit all the drug." FGD-PW-PHC-R-02

Several pregnant women, caregivers and community leaders reported financial constraints in procuring prescribed medications including SP and ITNs, resulting from shortages at public health facilities where they are free. The financial difficulties included transportation costs resulting from geographical barriers to public ANC facilities where IPTp and ITNs could be freely accessed. This was confirmed by ANC providers in public health facilities who elaborated that shortage of freely provided SP and ITNs in their facilities required that they write out prescriptions for pregnant women to buy them in

commercial shops. They added that this was not ideal as they were unable to observe the women taking the medications as DOT and hence some providers were hesitant about prescribing it for purchase at commercial stores.

"The major obstacle is money and to walk there…the centre is not close by." FGD-PW-FBF-S-01

"We don't have net to give to the pregnant women here. We only encourage them to try and buy. There was a time when government distributed net to some communities and streets, but they did not distribute it to our side… They should also call us for seminars on treating malaria in pregnancy. We also need instruments for the detection of malaria…They may call us and train us so that we too can be taking care of our pregnant women." SSI-FBF-S-01

"with IPT we run short, we ask them to buy in the market and that is costly for them… we always ask them to take it in our presence so that they will not keep it because some can take it as one today, one tomorrow or stretch the taking. So, to go and tell them to buy, personally, I discourage it because they may even buy fake ones." SSI-PHC-U-03

Participants also reported that the attitude of ANC providers at public health facilities discourages pregnant women from ANC attendance at public health facilities where they are more likely to freely access IPTp and ITNs. Pregnant women, caregivers, community leaders and TBAs cited instances where pregnant women experienced or shared their experiences about the negative attitudes of healthcare providers at public health facilities, which discourages pregnant women from attending ANC services in public health facilities. Despite having, limited access to IPTp and ITNs, pregnant women and caregivers reported that engaging with TBAs or faith-based birth attendants gave them positive experiences including acceptability, comfort and spiritual support as key reasons for their preference for TBA and faith-based birth homes.

"I come here [TBA] because mummy sees the baby and how the baby is doing like if she is sick like malaria that you asked… when I come they pray for me and because if they pray, I will not feel too much delivery pain…the mummy of this place is a very nice person, she comes here and plays with us." FGD-PW-TBA-S-01

"One can say mummy [TBA] this is what is happening to me, and they take care of you well here…they sit you down and explain things to you… the nurses [public hospital] are harsh …here, they play with us, sing, talk and advise us on what to do… Here [TBA], they take care of you more than they do in hospital…it's only during clinic day that you can ask questions, you are free to come anytime… in hospitals, it is not every one of the nurses that have time…I like here compared to the hospital." FGD-PW-TBA-R -02

"they [healthcare providers] shout at them…that one is common in most hospitals, they will just shout "sit down somewhere", and it is not meant to be so…because the women will not come… that's the place they get the net and medicine." SSI-CG-PHC-R-04

Pregnant women frequently detailed the influence of relatives or caregivers such as mothers-in-law, sisters and husbands on their choice of ANC provider, which influences access to IPTp. Several caregivers reported a preference for TBA or faith-based birth attendants, which limits pregnant women's access to IPTp and ITNs. The few caregivers who indicated a preference for ANC services in public health facilities reported that their wards received ITNs and medicines to protect them from MiP although none of them mentioned IPTp specifically. Male caregivers further elaborated that they provide transport fees for ANC attendance and acquiring ITNs while female caregivers reported encouraging pregnant women to attend ANC services and reminders to take medications and use of ITNs.

"My mother in law prefers to send me to a TBA, and when she took me there I ate all that they gave me … I still take the herbs which is better than taking medicines." FGD-PW-TBA-S-01

"my husband didn't allow me to use a TBA. So I gave birth to one of my children in maternity house so that's why I have been going…my husband's sister told me that this place was good so I should come here and I will be okay." FGD-PW-PHC-S-02

"So that the doctors should do theirs too], they should test them and do the needful [provide medical services] because there are somethings inside the tummy that mummy [TBA] can't see [that biomedical services can]."SSI-CG-PHC-R-04

"The clinic is near the house… my sister went there so she also goes there…she goes because whatever happens I will be responsible. … I monitor her when it is time for antenatal and I give her money and send her to the hospital…I usually ask her how far and ask after her welfare and what was discussed over there... If they give her drugs or they told her to go for scan, I make sure she does it." SSI-CG-PHC-S-04

Both caregivers and pregnant women frequently mentioned concurrent use of TBA and/or faith-based birth attendants with ANC services in public health facilities. Nearly all caregivers and some TBAs and faith-based birth attendants reported encouraging concurrent use of hospital ANC services, explaining that different ANC providers address different needs such as spiritual, emotional and medical. They elaborated that they encouraged attendance to ANC services in public health facilities so that pregnant women will receive ITNs and medical tests. Some pregnant women confirmed this, indicating that during attendance at TBAs and/or faith-based birth homes, they were encouraged to access ANC services at public health facilities so that they could access medical tests and medicines, most frequently the tetanus injections. TBAs who reported that they encouraged pregnant women to concurrently use their services and public health ANC services also indicated a cordial relationship with the public healthcare providers that they recommended.

"She goes to mom's [TBA] place and they give her herbs, the drugs for typhoid we do it at home…at the clinic they do tests to check if they have any disease." SSI-CG-TBA-U-01

"I registered at my mother-in-law's TBA centre…My mother-in-law knows the people here at the health centre so she tells us that it not only her place that we should come but that we should also be going to the centre because they give me water or medicine." FGD-PW-TBA-S01

"my pregnant women said they would not go there so I went with them to the hospital… they [public facility providers] give them drugs and injection so I make sure they go there too." SSI-CG-FBF-R-01

"Both hospital and TBA are good…. in the hospital they do give an injection... I don't know the name of that injection, she will be given five times… that is why mummy always say they should go and register in the hospital." SSI-CG-TBA-R-01

Discussion

This study provides in-depth insights into the factors influencing ITN and IPT uptake at the individual, interpersonal, social and provider levels in lower socioeconomic communities within Ogun State, Nigeria. Table 2 provides a summary of the study findings between and within the various levels. While these findings show a high awareness of MiP issues and use of ITN in preventing MiP at all levels of the social structure, there is low awareness of IPTp at the individual, social and at the health system level, among TBAs and faith-based birth attendants. Although awareness of IPTp for MiP was high among public healthcare providers, the notion that IPTp is aimed at treating MiP rather than preventing MiP was reported by some public healthcare providers. The choice of ANC provider, which facilitates access to and utilisation of IPTp and ITN, is influenced by several factors including the experiences of relatives with ANC providers, attitudes of ANC providers and community perceptions of ANC providers. Concurrent use of multiple ANC providers and ANC providers' relationships present opportunities for synergy to broaden acceptability and coverage for IPTp and ITNs.

At the individual and social levels, there is high awareness about MiP and its consequences contrary to findings of a previous study conducted in Nasarawa and Cross River States in Nigeria (4). Furthermore, the high awareness of ITN use as a preventive malarial strategy is similar to a recent study (15), but a low awareness of IPTp at the individual and social levels, is in contrast with the findings of that study. Very few pregnant women were able to specify sulfadoxine/pyrimethamine or its brand names such as fansidar and amalar as the preventive antimalarial given at public

health facilities. There was also poor knowledge of the dosage and frequency of IPTp at the individual, social and health levels, with some pregnant women misconceiving the injections that they received at ANC –possibly tetanus injections- as IPTp. Given that nearly half of the pregnant women were recruited from public health centres, the low awareness of IPTp suggests inadequate sensitisation at public health facilities, which contributes to the poor utilisation of the IPTp. It is plausible that the ANC group counselling at public health facilities provided inadequate details and/or were not reiterated during individual service provision due to inadequate numbers of healthcare providers grappling with large workloads. Considering low literacy rates in the study area, healthcare providers in public health facilities should intensify IPTp sensitisation. They should also emphasise the importance of taking IPTp to prevent MiP during individual encounters with the pregnant women at each and every ANC visit.

Consistent with findings of studies conducted in Nigeria and in other African countries (4, 16), at the individual level, the experience of perceived medication side effects or side effects from ITN use and pregnant women's hesitation to take medications during pregnancy in the absence of illness serve as barriers to improving uptake of IPTp. It is plausible that the experience of medication side effects further strengthens the perception of potential harm during pregnancy thereby discouraging the uptake of IPTp when it is not provided as DOT. Added to that, combination-based medications such as haematinics or vitamin supplements may facilitate the perception that taking IPTp is superfluous.

Access to IPTp at the individual level is further influenced by other interpersonal and social factors, such as relatives and caregivers influenced the type of ANC providers that pregnant women opt to access. As such, our findings regarding a preference for TBA ANC services at the individual and social levels are consistent with existing literature (9, 10). While ANC provider attitudes and interpersonal skills were stated as key reasons for the preference and trust in TBA ANC services, there was added social support for concurrent use of both or all types of ANC providers in this study. This perhaps, reflects the realities of integrating traditional healthcare practices and biomedical healthcare as well as changing health-seeking behaviours. It plausibly reflects a health-seeking behaviour to get the "best of both worlds" of healthcare by accessing traditional behavioural maternal support and the benefits of biomedical health care for pregnancy outcomes. While this provides an opportunity to further enhance the acceptability and uptake of IPTp among attending pregnant women, this health-seeking behaviour could further be harnessed by building the capacities of health care provider alternatives regarding MiP and the value of IPTp.

While financial and geographical barriers to ANC services in public health facilities cut across the individual and social levels, their impact on access to ITNs and IPTp remain prevalent as shown in this and other studies (6, 15, 16). Costs associated with procurement of SP and ITNs when they are out of stock at public health facilities directly affect pregnant women's access to IPTp and ITNs. Caregivers and family members (most often male partners) have the added burden of providing the finances needed to not only procure these services but also, due to longer distances to public health facilities, have to provide for the transportation and upkeep of pregnant women. While non-governmental organisations assist to improve free access to ITNs in rural and economically-disadvantaged communities, more commitment and synergy is needed between civil organisations and governments to ensure that such stock outs do not create financial burdens that entrench poverty within such settings and further hinder the uptake of IPTp.

In line with health policy directives at the health system level, IPTp is expected to be available at both public and private ANC facilities (4) yet, this study shows poor awareness of IPTp among ANC providers - faith-based birthing homes and TBAs (aspects of the health system), among caregivers and community leaders (social level) and pregnant women (individual). While IPTp awareness was high among ANC providers in public health facilities, the poor IPTp awareness among faith-based birth attendants and TBAs has implications for sensitisation, acceptability, access and uptake of IPTp. With about 60% of Nigerians accessing health care from private health facilities, and TBAs providing, a significant amount of ANC services (7, 9, 10); the poor awareness of IPTp by these providers hinders sensitisation and access to IPTp, which they are unlikely to provide as part of their ANC services. The few TBAs and faith-based providers with good relationships with public health service ANC providers encouraged their attending pregnant women to concurrently access ANC services

at public health facilities. This potentially reflects TBAs' recognition of public health service ANC providers' knowledge and expertise, which highlights the synergy that could be harnessed to expand IPTp uptake and contribute to improved pregnancy outcomes. Health care policy planners and implementers including the government should leverage on and develop approaches to ensure delivery of MiP control programmes by healthcare providers in the private sector. Given their wider reach to pregnant women, this would improve acceptability and uptake of IPTp by encouraging referrals to public health facilities. Indeed, studies have shown the potential of incorporating TBAs in the reduction of adverse maternal and child health outcomes in various settings (17, 18).

Similar to findings in other studies (15, 19), drug stock outs in public health facilities contribute to the low coverage of IPTp, highlighting lapses in the drug supply chain at all levels and the need for improved efficiency. It potentially explains why the NDHS 2018 found that despite over 57% of pregnant women attending at least four ANC visits in the last two years, only 17% of them with a live birth had received at least three IPTp doses (5). Such drug stock outs require that ANC providers prescribe IPTp for pregnant women to buy from commercial sources, which places financial constraints on pregnant women and their families. In addition, healthcare providers are reluctant to prescribe IPTp for pregnant women to access from commercial sources for fear of fake medications via unregulated drug outlets. This confirms findings at the individual and social levels where financial constraints to IPTp access were reported due to stock outs at the public health facility. Non-adherence to the national policy recommendation of administering IPTp as a directly observed therapy (20), also appears to be a key barrier to the patchy implementation of IPTp in this region. Given the concerns regarding poor quality drugs particularly in the African region (21), more effort is needed to identify and regulate community-based drug outlets while creating awareness among ANC providers on regulated drug outlets.

Conclusion

The study highlights a crucial need for health literacy programs that underscore the importance of accessing IPTp at all levels of the social structure while addressing the social and health sector factors contributing to the poor uptake of IPTp. In particular, opportunities exist for leveraging on changing health-seeking behaviours at the individual and social levels. Health implementers should network with TBAs and faith-based ANC providers to improve pregnant women's access to and utilisation of IPTp towards preventing MiP. Health literacy programs on MiP should extend beyond pregnant women, families and societies to TBAs and faith-based ANC providers. While health sector barriers to IPTp need to be addressed, there is a need for public health officials to engage and sensitise TBAs and faith-based providers on MiP and IPTp towards the goal of improving maternal and new-born health outcomes.

List Of Abbreviations

ANC Antenatal care (ANC)

DOT Directly observed therapy

FGD (s) Focus group discussion (s)

ITNs Insecticide-treated bed nets

IPTp Intermittent preventive treatment of Malaria in Pregnancy

MiP Malaria in pregnancy (MiP)

NDHS Nigerian Demographic and Health Survey

RA (s) Research Assistant (s)

SEM Socio-ecological model

SP Sulfadoxine-pyrimethamine

SSA sub-Saharan Africa

SSI (s) Semi-structured interview (s)

TBA (s) Traditional Birth Attendant (s)

WHO World Health Organization

Declarations

Ethics approval and consent to participate:

Ethical approval for the study was received from the Ethics Review boards of Babcock University (BUHREC056/19) and the Ogun State Ministry of Health (HPRS/381/290). All study participant provided verbal and written/thumb printed consent.

Consent for publication:

All study participants provided verbal, written or thumb printed approval

Availability of data and material:

The datasets generated and/or analysed during the current study are not publicly available due to participant identifying information contained in the data files but are available from the corresponding author on reasonable request.

Competing interests:

The authors declare that they have no competing interests

Funding:

This manuscript is part of a larger study funded by a QR-GCRF (Research England, University of Sheffield) Sustainable partnerships Grant X/159770. The funders did not play any role in the design of the study, data collection, analysis and development of this manuscript.

Authors contributions:

GNN (PhD Global Health), coded, analysed, interpreted and wrote the manuscript. AO (Obstetrician/Gynaecologist.) conceived the study and with, MOO (PhD Demography and Social Statistics) supervised data collection and transcription, coding and revising the manuscript. OW (Professor of Clinical Pharmacology) and DA (Professor of Obstetrics and Gynaecology) contributed to the conception and design of the study and contributed to the interpretation and revision of the manuscript. All authors read and approved the final manuscript and are accountable for all aspects of the manuscript.

Acknowledgements:

We acknowledge the Research England, University of Sheffield Sustainable partnerships Grant body for funding this project. The authors also thank the leaders of the study communities and the study participants for participating in this study. We also thank the directors and staff of the ANC facilities where study participants were identified and recruited.

References

1. Organization WH. Global Malaria Programme: World malaria Report 2016.
2. Organization WH, UNICEF. Trends in maternal mortality: 1990-2015: estimates from WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. 2015.
3. Organization WH. World malaria report 2019. Geneva: World Health Organization; 2019. 2020.
4. Diala CC, Pennas T, Marin C, Belay KA. Perceptions of intermittent preventive treatment of malaria in pregnancy (IPTp) and barriers to adherence in Nasarawa and Cross River States in Nigeria. Malaria journal. 2013;12(1):342.
5. ICF NPCNNa. Nigeria Demographic and Health Survey 2018 Key Indicators Report.: NPC and ICF Abuja, Nigeria, and Rockville, Maryland, USA.; 2019.
6. Oladimeji KE, Tsoka-Gwegweni JM, Gengiah S, Daftary A, Naidoo K. Barriers to effective uptake of malaria prevention interventions in Ibadan, South West Nigeria: a qualitative study. International Journal Of Community Medicine And Public Health. 2018;5(4):1304-10.
7. Mokuolu OA, Ntadom GN, Ajumobi OO, Alero RA, Wammanda RD, Adedoyin OT, et al. Status of the use and compliance with malaria rapid diagnostic tests in formal private health facilities in Nigeria. Malaria journal. 2016;15(1):4.
8. Abuja N, Rockville M. USA: NPC and ICF International; 2014. National Population Commission (NPC) Nigeria and ICF International Nigeria Demographic and Health Survey. 2013.
9. Ofili A, Okojie O. Assessment of the role of traditional birth attendants in maternal health care in Oredo Local Government Area, Edo State, Nigeria. Journal of Community Medicine and Primary Health Care. 2005;17(1):55-60.
10. Ebuehi OM, Akintujoye I. Perception and utilization of traditional birth attendants by pregnant women attending primary health care clinics in a rural Local Government Area in Ogun State, Nigeria. International journal of women's health. 2012;4:25.
11. Sallis JF, Owen N, Fisher E. Ecological models of health behavior. Health behavior: Theory, research, and practice. 2015;5:43-64.
12. Glaser BG, Strauss AL. Discovery of grounded theory: Strategies for qualitative research: Routledge; 2017.
13. Walker D, Myrick F. Grounded theory: An exploration of process and procedure. Qualitative health research. 2006;16(4):547-59.
14. Britten N. Qualitative research: qualitative interviews in medical research. Bmj. 1995;311(6999):251-3.
15. Ameh S, Owoaje E, Oyo-Ita A, Kabiru CW, Akpet OEO, Etokidem A, et al. Barriers to and determinants of the use of intermittent preventive treatment of malaria in pregnancy in Cross River State, Nigeria: a cross-sectional study. BMC Pregnancy and Childbirth. 2016;16(1):99.
16. Pell C, Straus L, Andrew EV, Menaca A, Pool R. Social and cultural factors affecting uptake of interventions for malaria in pregnancy in Africa: a systematic review of the qualitative research. PloS one. 2011;6(7).
17. Sibley LM, Sipe TA, Barry D. Traditional birth attendant training for improving health behaviours and pregnancy outcomes. Cochrane database of systematic reviews. 2012(8).
18. Adu-Gyamfi S, Gyasi RM, Poku BA. Women Assisting Women in a Village in Ghana: The Role of Traditional Birth Attendants in Wurubegu-Anansu. International Journal of Body, Mind and Culture. 2018;5(1):46-60.
19. Thiam S, Kimotho V, Gatonga P. Why are IPTp coverage targets so elusive in sub-Saharan Africa? A systematic review of health system barriers. Malaria Journal. 2013;12(1):353.
20. Federal Ministry of Health N. NATIONAL GUIDELINES AND STRATEGIES FOR MALARIA PREVENTION AND CONTROL DURING PREGNANCY. Federal Ministry of Health, Nigeria; 2014.
21. Karunamoorthi K. The counterfeit anti-malarial is a crime against humanity: a systematic review of the scientific evidence. Malaria journal. 2014;13:209-.

Tables

Table 1
Characteristics of study participants (N = 201)

A. Characteristics of 15 FGD study participants (N = 132)

Description of Participants	FGDs conducted	ID	No. of participants	Age	No. of children	Education	Language
Pregnant women attending ANC at primary health centre in a rural location	2	FGD-PW-PHC-R	8–10	18–39	0–4	None-Secondary	Yoruba
Pregnant women attending ANC at TBA Centre in a rural location	2	FGD-PW-TBA-R	8–10	18–40	0–4	None-Secondary	
Pregnant women attending ANC at a faith-based centre in a rural location	1	FGD-PW-FBF-R	7	19–28	0–4	None-Secondary	
Pregnant women attending ANC at primary health centre in a semi-urban location	3	FGD-PW-PHC-S	8–11	18–39	0–4	None-tertiary	
Pregnant women attending ANC at TBA Centre in a semi-urban location	1	FGD-PW-TBA-S	10	18–36	0–4	None-primary	
Pregnant women attending ANC at a faith-based centre in a semi urban rural location	1	FGD-PW-FBF-S	8	18–30		0–4	

A. Characteristics of 15 FGD study participants (N = 132)						
Pregnant women attending ANC at primary health centre in an urban location	3	FGD-PW-PHC-U	7–9	18–40	0–4	None-tertiary
Pregnant women attending ANC at a faith-based centre in an urban location	2	FGD-PW-FBF-U	7–10	20–32	0–4	None-secondary

B: Characteristics of semi-structured interviews participants (N = 69)						
Type of Participants	ID	Number conducted	Location	Duration	Educational Status	Language
Pregnant women	IDI-PW-(PHC/TBA/FBF)	30	PHC, TBA and faith-based birthing homes	30–50	Primary – tertiary	Yoruba
Caregivers/family members	IDI-CG-(PHC/TBA/FBF)	20	Rural and semi urban Ogun	25–40	Primary – tertiary	Yoruba/English
Community leaders	SSI-CM_	7	Rural and semi-urban Ogun	NA	Primary – secondary	Yoruba/English
TBAs	SSI-TBA-	4	Rural and semi urban Ogun	30–50	None - primary	Yoruba
Faith-based birthing homes	SSI-FBF-	4	Private birthing homes	30–45	Secondary –tertiary	Yoruba
Healthcare providers	SSI–PHC-R/S/U (Rural/Semi-urban/Urban)	4	PHC, CHO	30–65	Tertiary	English

Table 2
Summary of study findings

Type of participant	Level	Factors influencing IPTp uptake and use of ITNs
Pregnant women	*Individual*	High ITN awareness
		Poor knowledge on how and when to use ITNs
		Low IPTp awareness
		Poor adherence to IPTp as DOT
		Experienced and perceived medication side effects
		Accessibility of ITNs and IPTp determined by type of ANC provider visited
		Fear of taking medications when they are not sick
		Preference for TBAs and faith-based attendants ANC services due to family influence or personal experiences
		Use of haematinics
		Geographical accessibility
		Financial barriers
Caregivers & community leaders	*Interpersonal and social*	Financial barriers
		Little or no awareness of IPTp
		High awareness and support for use of ITNs
		Health provider attitudes at public health facilities
		Encouraging concurrent use of various ANC providers
		Stock outs in public health facilities, purchase from commercial sources
TBAs and faith-based providers	*Social and health system*	High awareness and support for ITN use
		Little or no awareness and access to IPTp
		Use of herbal remedies and spiritual waters that enhance maternal health
		Encouraging pregnant wards to use their services concurrently with public health ANC services
Health providers	*Health system*	High awareness and free access to ITNs and IPTp
		Perception of SP as a treatment strategy for MiP
		Routine stock outs of ITNs and SP requiring prescriptions for access from commercial sources
		Poor ANC attendance by pregnant women
		Reluctance to prescribe SP because of fear of it being obtained from unregulated sources

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryFile2Interviewguides.pdf
- SupplementaryFile1COREQ.docx