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Admittance and Use of Interference for Preclusion and Treatment of Malaria among Pregnant Women in COVID-19 Era in Nsukka Urban

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ABSTRACT

Pregnant women in malaria-endemic areas do not always receive the necessary prevention and treatment they need and this contributes to the extremely high numbers of maternal and infant deaths caused by malaria especially in COVID-19 era. Therefore, this study examined access and use of intervention for prevention and treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State. The study is made up of four research questions, specific objectives and three hypotheses. The hypotheses were tested at 0.05 significant level. The sample size for the study is four hundred 200 pregnant women and nursing mothers. Questionnaire was the instrument for data collection. The study employed quantitative method of data analysis. The researcher used Statistical Package for Social Sciences (SPSS) version 2020 to run data analysis. Descriptive statistics such as percentage and frequency tables were employed in answering the research questions, while the study hypotheses were tested using Chi-Square statistics. The findings revealed that there is low level of access to intervention for prevention of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State. There was no significant intervention employed for treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State. There is also significant challenge that faced the intervention for prevention and treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State.

Introduction

Malaria is a life-threatening disease primarily found in tropical countries. It is both preventable and curable. However, without prompt diagnosis and effective treatment, a case of uncomplicated malaria can progress to a severe form of the disease, which is often fatal without treatment (WHO, 2022). Malaria is a parasitic infection, caused by parasites of the genus *Plasmodium* and transmitted by *Anopheles* mosquitoes, that leads to an acute life-threatening disease and poses a notable global health threat. In Nigeria, malaria's ill effects on pregnant women and children under five differ according to transmission and immunity levels (Udoka, 2019).

In areas of low or unstable malaria transmission, women have no significant level of immunity and will develop clinical illness when parasitaemic. Udoka (2019) further stated that they are at risk of dying from severe malarial disease or from experiencing spontaneous abortion, premature delivery or stillbirth. In areas of high or moderate (stable) malaria transmission, women are semi-immune, and most malaria infections, although asymptomatic, can contribute to severe maternal anaemia and thus increased risk of maternal death (Iriemenam, Shah, & Gatei, 2016). Malaria infection of the placenta and malaria-caused maternal anaemia contribute to low birth weight, which results in higher infant mortality and impaired child development. In December 2019, a new coronavirus (COVID-19) was identified to be responsible for many pneumonia cases in Wuhan, a city in the Hubei Province of China (World Health Organization [WHO], 2022). The number of cases has then increased exceedingly in China, and then all over the world causing an epidemic. While malaria and COVID-19 can have similar presentation, common symptoms they share include but not limited to: fever, breathing difficulties, tiredness and acute onset headache, which may lead to misdiagnosis of malaria for COVID-19 and vice versa, particularly when clinician relies mainly on symptoms. Decision-makers needed to make difficult choices to ensure that COVID-19 and other urgent, ongoing public health problems- including malaria endemics—are addressed while minimizing risks to health workers and communities.

Malaria in pregnancy has a devastating effect on the health of mothers and their babies, and is an important cause of increased maternal and infant mortality and morbidity in the COVID-19 era (Shulman, 2021). The greatest effect of malaria in pregnancy is concentrated in sub-Saharan Africa and is associated with *Plasmodium falciparum* infection. However, pregnant women are also at risk of *Plasmodium vivax* malaria. Although its burden seems to be lower than that of *P falciparum, P vivax* malaria is still associated with harmful consequences for maternal and infant health (Menon, 2022). WHO promotes three strategies for the control of *P falciparum* infection in pregnancy in Africa, which include provision of intermittent preventive treatment for malaria in pregnancy (IPTp) with sulfadoxine-pyrimethamine (SP), use of insecticide-treated nets (ITNs), and prompt diagnosis and treatment of confirmed infections. Unlike in stable transmission areas, no global recommendations currently exist for the prevention of malaria in pregnancy in low-transmission areas or those *P vivax* predominates (Brabin, 2023).

Accordingly, the main challenge for reducing the burden of malaria in pregnancy in Africa is related to the adoption of national policies that incorporate WHO guidance, and effective implementation and scaling-up of programmes (Steketee, 2016). Together, these programmes must address both supply and demand challenges and derive clear lessons from assessment of new approaches to the delivery of preventive strategies, such as maximisation of coverage through community-directed interventions delivered by community health workers such as those in Nsukka Local Government Area. However, in Nsukka Local Government Area of Enugu state, Nigeria, targets for malaria control in pregnancy are far from being reached, despite global gains in malaria investment during the COVID-19 era, which have resulted in substantial overall reductions in deaths from malaria and the existence of highly cost-effective tools for malaria in pregnancy that have potential to save many maternal and neonatal lives (Ezeja, 2021). The challenges for effective control of malaria in pregnancy in Nsukka Local Government Area need a multidisciplinary approach that includes the coordination and integration of programmes for malaria and maternal and reproductive health, increased provision of resources to provide the best antenatal care, and investigation of the role of new

and innovative delivery approaches to maximise coverage of interventions to prevent malaria particularly in this COVID-19 era.

It is based on this background that this study aims at examining access and use of intervention for prevention and treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State. This study will also determine the challenges that faced the intervention for prevention and treatment of malaria among pregnant women, and strategies employed to mitigate challenges that face the intervention for prevention and treatment of malaria among pregnant women

Statement of Problem

Africa bears 90% of the world's burden of malaria. Pregnant women in Africa are particularly vulnerable to the adverse consequences of malaria caused by the most lethal parasite, *Plasmodium falciparium*. The African region of the world health organization experiences the majority of the global burden of malaria associated maternal illness and low birth weight. Pregnant women in malaria-endemic areas do not always receive the necessary prevention and treatment they need and this contributes to the extremely high numbers of maternal and infant deaths caused by malaria especially in COVID-19 era (WHO, 2022). Malaria-related deaths frequently occur in Nigeria. Seasonality has been implicated in the understanding of malaria cases and deaths, with a higher proportion of malaria cases and deaths reported during the rainy season.

Antimalarials have helped to keep malaria cases and deaths at a minimum (Menon, 2022). If access to antimalarials and malaria treatment gets disrupted, the impact on deaths is significant. Under a scenario of disruptions to essential malaria services, such as reduction in case management, the impact could be profound. Malaria-related deaths frequently occur in Nigeria. Seasonality has been implicated in the understanding of malaria cases and deaths, with a higher proportion of malaria cases and deaths reported during the rainy season. Antimalarials have helped to keep malaria cases and deaths at a minimum (Menon, 2022). If access to antimalarials and malaria treatment gets disrupted, the impact on deaths is significant. Under a scenario of disruptions to essential malaria services, such as reduction in case management, the impact could be profound. Therefore, it is important to assess the impact of the malaria intervention coverage before and during the COVID-19 pandemic. The findings from this study would help design programs that will help sustain progress made on malaria intervention coverage in the future. This study, therefore, aimed to examine the access and use of intervention for prevention and treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State.

Objectives of the Study

The overall objective of this study is to find out the access and use of intervention for prevention and treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State.

The specific objectives of this study are:

1) To determine level of access to intervention for prevention of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State.
2) To find out the use of intervention for treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State.
3) To identify the challenges that faced the intervention for prevention and treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State.
4) Suggest strategies that can be employed to mitigate challenges that face the intervention for prevention and treatment of malaria among pregnant women in Nsukka Local Government Area of Enugu State

Literature Review

Ishaq, Tukur and Yakasai (2021) conducted a study on Effect of Malaria in Pregnancy in Some Selected Primary Healthcares in Kano Municipal Local Government Area, Kano State. The main purpose of the study was to find out the Effect of Malaria on Pregnant Mothers at Kano Municipal Local government Kano State. This was a cross-sectional

study in which 200 pregnant women was chosen from selected Primary Health Care Centres within Kano Municipal Local Government, Kano. And used a validated and pre-tested questionnaires to collect data. Collected data were analyzed using Statistical Software for Social Sciences (SPSS) and the results presented in tables and figures. The study showed effect of malaria in pregnancy at 57.5%, and the incidence of malaria in pregnant women at 53.5% that it causes complications. And 55.5% of the pregnant women know that malaria causes low birth weight, also 59.0% of the respondents knows that there are ways of preventing malaria in pregnancy and 50.5% of the pregnant women have knowledge of the preventive measures of malaria in pregnancy. Slightly above 50% of pregnant women have basic knowledge on the effect of malaria on Pregnancy and it causes complication. Also have basic knowledge on modes of malaria transmission. They also have knowledge of the preventive measures of malaria in pregnancy.

Muhammad and Muhammad (2022) conducted a study on Malaria Prevalence Among Pregnant Women Attending Kwadon Primary Health Care, Yamaltu Deba Local Government Area, Gombe State, Nigeria. The study which was conducted from June to December, 2021 and investigated the prevalence of malaria among pregnant women in some selected villages of Yamaltu-Deba Local Government Area of Gombe State, Nigeria. 384 consented pregnant women attending antenatal at Kwadon primary health clinic were enrolled. Vein puncture technique was used to collect venous blood and analysed microscopically using Gemsa staining technique. *Plasmodium falciparum* malaria was detected using microscope with x100 objective lens. Malaria parasites were found in 81(21.09%) of the 384 samples collected, highest prevalence was documented from Wajari village. Malaria infection was not statistically linked with the respondents' village (x2=5.847, df=4, P>0.05). Older pregnant women aged 40-45 years had the highest prevalence of 2(40.00%), while subjects aged 36-40 years had the lowest prevalence of 36.0%. Malaria infection was not statistically associated with the subject's age (x2=4.816, df=6, P>0.05). Subjects in first trimester and multigravida had the highest prevalence of 02(28.57%) and 63(29.57%) respectively. Statistically malaria infection was not associated with the pregnant women's trimester (x2=0.355, df=2, P>0.05) and gravidity (x2=1.825, df=2, P>0.05). In conclusion, moderate level of malaria infection was recorded from the selected villages and older pregnant women suffer most from the disease.

Mangusho, Mwebesa, Izudi, Aleni, Dricile, Ayiasi and Legason (2023) conducted a study on high prevalence of malaria in pregnancy among women attending antenatal care at a large referral hospital in north-western Uganda: A cross-sectional study. The scholars conducted an analytic cross-sectional study between October and December 2021. We used a paper-based structured questionnaire to collect data on maternal socio-demographic and obstetric factors and malaria preventive measures. Malaria in pregnancy was defined as a positive rapid malarial antigen test during ANC visits. We performed a modified Poisson regression analysis with robust standard errors to determine factors independently associated with malaria in pregnancy, reported as adjusted prevalence ratios (aPR) and 95% confidence intervals (CI). We studied 238 pregnant women with a mean age of 25.32±5.79 years that attended the ANC clinic, all without symptomatic malaria. Of the participants, 173 (72.7%) were in their second or third trimester, 117 (49.2%) were first or second-time pregnant women, and 212 (89.1%) reported sleeping under insecticide-treated bednets (ITNs) every day. The prevalence of malaria in pregnancy was 26.1% (62/238) by rapid diagnostic testing (RDT), with the independently associated factors being daily use of insecticide-treated bednets (aPR 0.41, 95% CI 0.28, 0.62), first ANC visit after 12 weeks of gestation (aPR1.78, 95% CI 1.05, 3.03), and being in the second or third trimester (aPR 0.45, 95% CI 0.26, 0.76). The prevalence of malaria in pregnancy among women attending ANC in this setting is high. We recommend the provision of insecticide-treated bednets to all pregnant women and early ANC attendance to enable access to malaria preventive therapy and related interventions.

Damisa and Hassan (2021) conducted a study on prevalence of malaria among pregnant women attending antenatal care in General Hospital Saminaka, Lere Local Government Area of Kaduna State. This study was aimed at determining the prevalence, predisposing and risk factors of malaria among pregnant women attending antenatal care in general hospital Saminaka, Lere Local Government Area, Kaduna State. Four hundred and eighteen (418)

blood samples were randomly collected among the pregnant women attending ante natal care in General Hospital Saminaka and then taken to the laboratory for examination. The investigation was carried from November, 2018 to January, 2019. Thick and thin blood films were employed for the diagnosis. Results shows that 88 (21%) had no malarial infection, 330 (79%) had malarial infection: of which 56 (17%) had anaemia as complication due malarial in pregnancy, 13 (4%) had miscarriage and 3 (1%) had hypoglycemia. Woman with age bracket of 15-20 has the highest prevalence 138(33.0%), followed by those with age bracket, 21-25(30.4%) and then those with age group of 26-30 (21.5%) respectfully, while age group of 31-35 and 36-40 had the lowest prevalence of 31 (7.4%) and 32 (7.7%). Respondents occupation shows Trader were the highest with the frequency 159(38%), Unemployed (house Wife) 112 (26.8%), Civil Servant 37(8.9%), Unskilled Labourers 16(3.8%) and Farmers 9(2.2%) respectfully. Respondents level of education shows Primary were the highest with frequency of 128(30.6%), Secondary 126(30.1%), Informal 77(18.4%) and Tertiary 44(10.5%) respectfully. It was concluded that the ability to conduct a comprehensive evaluation of the prevalence of malaria infection among the pregnant women is a major challenge. Malaria is playing a considerable role in causing anaemia, miscarriage, hypoglycemia in pregnancy in this part of the globe. In most part of the developing world like Nigeria, maternal and child health services should be given utmost support at every level for the prevention and control of malaria in pregnant women.

Theoretical Framework

The theoretical orientation of this study is hinged on Health Belief Model (HBM). HBM is the theoretical framework for this study. HBM is a psychological model designed to help explain and predict health behaviors (Rustvold, 2012). The model was developed by social psychologists Hochbaum, Rosenstock, and Kegels in the 1950s (Rosenstock, 1974). The theory indeed despite its shortcomings aptly captures the thrust of the study. However, the theory posits that the six constructions of HBM which are the main tenets of the model include: Perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cue to action, and demographics or psychological structures. In terms of application, the HBM is relevant to this study because the researcher engaged participants (Pregnant women in Nsukka) in such a way that they embraced the idea that treatment of malaria during COVID-19 can be prevented by individual action and encourage participants that they can be successful in their action.

Area of Study

The study was carried out in Nsukka Local Government Area of Enugu State. The area is located in Enugu North Senatorial Zone of Enugu State. It shares boundaries with Igbo-Eze South on the North, Ukehe and Ohodo in Igbo-Etiti Local Government Area on South, Uzo-Uwani Local Government Area on south, Uzo-Uwani local government on the west, and Orba in Udenu Local Government Area on the East. Nsukka Local Government Area is made up of the following communities: Ihe-Owerre, Nkpunano, Nru, Nsukka LGA has an area of 1,810km2 and a population of 309,488 at the 2006 census, Nsukka lies between latitude 6^{0}18' and 7051 East (Eke, 2007). The area was used for the study because there are many pregnant women within three years in the area. This will help the research get an unbiased responses from different respondents used in the study.

Data and Method

The study adopted a multi stage cluster sampling method in generating data. Cluster and simple random sampling techniques were used to select 200 respondents. This research design is appropriate for collecting information from a study population and also allows the use of a selected sample to describe or represent a large population at a given point in time. Sills (1998) opines that survey is proven to be the best methods for studies of attitudinal and behavioural trends. Questionnaire was the major instrument for data collection.

Table 1: Percentage Distribution of Respondents by community

S/N	Communities	Frequency	Percentage (%)
1	Ihe/Owerre	75	37.5
2	Nkpunano	70	35
3	Nru	55	27.5
	Total	**200**	**100**

Table 2: Opinion on whether women with high level of education are more likely to be aware of health centers for malaria prevention services than women with low level of education.

S/N	Response	Frequency	Percentage (%)
1	Yes	90	45
2	No	65	32.5
3	Don't know	45	22.5
	Total	**200**	**100**

Source: Field Study, 2023

Table 3: Opinion on whether there are benefits from the interventions

S/N	Response	Frequency	Percentage (%)
1	Yes	100	50
2	No	70	35
3	Don't know	30	15
	Total	**200**	**100**

Table 4: Opinion on whether interventions employed by government for treatment of malaria among pregnant women in COVID-19 era

S/N	Response	Frequency	Percentage (%)
1	Yes	95	47.5
2	No	60	30
3	Don't know	45	22.5
	Total	**200**	**100**

Table 5: Opinion on whether respondents have heard about any campaign by Enugu State Government for prevention and treatment of malaria among pregnant women

S/N	Response	Frequency	Percentage (%)
1	Yes	110	55
2	No	60	30
3	Don't know	30	15
	Total	**200**	**100**

Source: Field Study, 2023

The study is designed to ascertain access and use of intervention for prevention and treatment of malaria among pregnant women in covid-19 era in Nsukka Local Government Area of Enugu state.In testing of hypothesis, a cross tabulation of the research variables was carried out using the Chi-Square (X2) statics in SPSS version 20.

Hypotheses One

Substantive Hypothesis :Women with high level of education are more likely to be aware of health-centers for malaria prevention services than women with low level of education.

Null Hypothesis :Women with high level of education are less likely to be aware of health-centers for malaria prevention services than women with low level of education.

Table 6: How do you think women with high level of education are more likely to be aware of healthcenters for malaria prevention than women with low level of education ? Do you believe there is an influence of education with regards to their health awareness ? Cross tabulation.

		Do you believe that there is a perceived influence of education with regards to their level of health awareness ?			
		Yes	**No**	**Don't know**	**Total**
How do you think There is a perceived Influence of education to their level of awareness ?	Agree	35(35%)	40(40%)	25(25%)	100(100%)
	Disagree	50(71.4%)	10(14.3%)	10(14.3)	70(100%)
	Don't know	5(16.7%)	15(50%)	10(33.3%)	30(100%)
		90(45%)	65(32. 5%)	45(22.5%)	200(100%

Source: *Field survey, 2023* **X^2 =. 2.7; df = 4; p = .609**

Hence, since the level of significance is p = 609 is higher than the alpha value 0.05, we accept the null hypothesis which states that Women with high level of education are less likely to be aware of health-centers for malaria prevention services than women with low level of education, and then reject the substantive hypothesis which states that Women with high level of education are more likely to be aware of health-centers for malaria prevention services than women with low level of education.

Hypotheses Two

Substantive Hypothesis: There is a perceived relationship between the persistent of malaria among pregnant Women and absence of strict measures for dealing with the phenomenon.

Null Hypothesis :There is a no perceived relationship between the persistent of malaria among pregnant Women and absence of strict measures for dealing with the phenomenon.

Table 7: How do you think there is a perceived relationship between the persistence of malaria among pregnant women and the absence of strict measures for dealing with the phenomenon ? Do you believe there is a perceived relationship between the both? Cross tabulation

		Do you believe that there is a perceived relationship between the persistence of malaria among pregnant women and absence of strict measures?			
		Yes	No	Don't know	Total
How do you think There is a perceived Relationship between the persistence of malaria among pregnant women and the strict measures to curb it?	Agree	55(50%)	35(31.8%)	20(18. 2%)	110(100%)
	Disagree	35(58.3%)	20(33.3%)	5(8.33)	60(100%)
	Don't know	5(16. 7%)	5(16.7%)	20(66.7%)	30(100%)
		95(47.5%)	60(30%)	45(22.5%)	200(100%

Source: *Field survey, 2023* **X^2 =. 587; df = 4; p = .003**

In Table 25, when the data was subjected to chi-square, the P value (.003) was higher than the alpha value of .05, therefore we reject the substantive hypothesis which states that There is a perceived relationship between the persistent of malaria among pregnant Women and absence of strict measures for dealing with the phenomenon. And accept the null hypothesis which state that There is a no perceived relationship between the persistent of malaria among pregnant Women and absence of strict measures for dealing with the phenomenon.

Discussion of Research Findings

The study used two hundred respondents to investigate the access and use of intervention for prevention and treatment of malaria among pregnant women in covid-19 era in Nsukka Local Government Area of Enugu state. The findings from the two hypotheses shed light on the complex landscape of malaria prevention and treatment interventions among pregnant women in Nsukka Local Government Area during the COVID-19 era. Hypothesis one, focused on how Women with high level of education are more likely to be aware of health-centers for malaria prevention services than women with low level of education. The study found that the educational attainment of the respondents is not a defining factor in whether pregnant women will be aware of the malaria Healthcare facilities and prevention, thus stating the fact that there are so many other factors that influences the level of awareness of malaria prevention on the parts of the pregnant women other than the educational part. This finding is consistent with the results of a study by Udeozor and Ibe (2016), which showed that there was no significant
difference between the level of education and access to Healthcare delivery and malaria prevention.

Conversely, Hypothesis Two delved into the fact that there is a perceived relationship between the persistent of malaria among pregnant Women and absence of strict measures for dealing with the phenomenon. This aligns with a study titled 'Measures, Knowledge, and Attitudes towards Malaria prevention in Nigeria' by Nwanbueze and Mbaezue (2011). Emphasizing more on it, an effective mechanism and effective policies towards malaria prevention have a long way in mitigating the causes and it's effects on the lives of pregnant women.

In summary, these findings underscore the importance of continued efforts to enhance access to malaria prevention interventions, potentially improve treatment interventions, and address the challenges

faced in implementing these measures among pregnant women in Nsukka Local Government Area during the COVID-19 era. Further research and targeted interventions are warranted to better understand and address the nuances of malaria prevention and treatment in this specific context.

Summary

This study is on the access and use of intervention for prevention and treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State. The research study was made up of four specific objectives which are to determine level of access to intervention for prevention of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State; To find out the use of intervention for treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State; To identify the challenges that faced the intervention for prevention and treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State; and to Suggest strategies that can be employed to mitigate challenges that face the intervention for prevention and treatment of malaria among pregnant women in Nsukka Local Government Area of Enugu State

The literature review reviewed concepts such as concepts of malaria, covid-19, malaria in pregnancy and interventions. Also, the empirical literature was done under topical issues such as intervention for prevention and treatment of malaria among pregnant women in COVID-19 era. Under review of relevant theories, theories such theory of Health Belief Model, structural theory, Systems theory, and Behavioural theory were reviewed. The theoretical framework was based on Health Belief Model by (Rosenstock, 1974).

Under research methodology, the sample size for the study was 400 pregnant women and nursing mothers in Nsukka. Questionnaire was the instrument for data collection. The study will employed quantitative method of data analysis. The researcher used the Statistical Package for Social Sciences (SPSS) version 2020 to run data analysis. Descriptive statistics such as percentage and frequency tables were employed in characterizing the respondents. Mean and standard deviation were used in answering the research questions, while the study hypotheses were tested using Chi-Square statistics. Finally, findings showed that there is low level of access to intervention for prevention of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State. There was no significant intervention employed for treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State. There is also significant challenge that faced the intervention for prevention and treatment of malaria among pregnant women in COVID-19 era in Nsukka Local Government Area of Enugu State.

Recommendation

According to the results of findings, the study recommends the following:

(1) The approach to monitoring and evaluation of control programmes for malaria during pregnancy should focus on a limited number of indicators that can be used at minimal cost to track implementation progress and alert programme managers of obstacles.
(2) Regular supervision of trained health personnel is important to motivate staff and ensure quality of care. The issue of an overall strategy for human resources development should be addressed within the context of national health systems even after COVID-19 pandemic.
(3) Well-trained and well-equipped health care workers are required to support implementation and provide quality care. Intensification of training and retraining of health personnel is a priority. In-service training regarding policy and guidelines for malaria prevention and control during pregnancy should be conducted at all levels of the health system.

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