Exploratory Research in Clinical and Social Pharmacy 11 (2023) 100308

Contents lists available at ScienceDirect

Exploratory Research in Clinical and Social Pharmacy

journal homepage: www.elsevier.com/locate/rcsop

A cross-sectional study on the knowledge, attitude, and practice of pregnant women regarding medication use and restriction during pregnancy.

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ARTICLE INFO

Keywords:
Pregnancy
Medication
Use
Knowledge
Attitude
Practice

ABSTRACT

Background: The use of medication during pregnancy is a complex issue that requires careful consideration to avoid potential harm to the developing fetus. Despite the existence of guidelines and restrictions on medication use during pregnancy, pregnant women in Nigeria often have limited access to information regarding drug use and may rely on their own judgment or the advice of non-professionals when making decisions about medication use.

Objectives: To assess Nigerian pregnant women's knowledge, attitude, and practice toward the use of drugs and restriction/contraindications in pregnancy.

Methods: A descriptive cross-sectional study was conducted among pregnant women who visited the Federal Medical Center, Umuahia, from January to February 2023. A self-administered questionnaire was answered by conveniently sampled participants. Data were collected about their sociodemographic characteristics, knowledge, attitude, and practice. Descriptive statistics and inferential statistics utilizing the Pearson's chi-Square test were used for data analysis. The level of significance was set at $p < 0.05$.

Results: One hundred and fifty-two pregnant women completed the questionnaire (60.8% response rate) and were mostly married ($n = 148$; 95.0%). Majority were between the age of 25 to 35 years ($n = 107$; 70.4%), had a university/bachelor's degree ($n = 94$; 61.8%), and were business women ($n = 85$; 56.0%). About 35.5% of the respondents had good knowledge of medication restrictions in pregnancy. The majority of the respondents had a positive attitude ($n = 98$; 64.5%) and good practice ($n = 139$; 91.4%).

Conclusion: The findings established that a substantial proportion of the women had a positive attitude and good practice of medication use and restrictions in pregnancy. However, the level of knowledge was surprisingly poor among the study group. There is a need to educate pregnant women on safe medication use and avoidance during pregnancy.

1. Introduction

The use of medications in pregnancy continues to present challenges and concerns, particularly due to the ability of some

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https://doi.org/10.1016/j.rcsop.2023.100308
Received 12 June 2023; Received in revised form 11 July 2023; Accepted 11 July 2023
Available online 13 July 2023

medications to cross the placental barrier and cause harm to the fetus.[1] Pregnancy comes with physiological and pharmacokinetic changes influencing the efficacy and the safety of drugs. While the use of medications in pregnancy is worrisome, it is unavoidable because of underlying diseases such as epilepsy, diabetes, and asthma that could exist in pregnant women and would require ongoing management with medications. During pregnancy, women may develop gestational hypertension, worsening headache, heartburn, and other pregnancy-related health issues that are remedied with medications. Due to ethical concerns, studies of drugs among pregnant women are lacking and medication use is limited to a few drugs with established safety profiles.[2]

Following the thalidomide era, the U.S. Food and Drug Administration (FDA) in 1979, established a system to determine the teratogenicity of drugs and classified pregnancy drugs into category A, B, C, D and X based on data from animal studies and clinical trials.[3] Category A drugs are generally regarded as safe while the category X drugs are contraindicated. Data from human studies demonstrate that category B drugs pose no risk to the fetus and can be used safely in pregnancy. While the risks cannot be ruled out in category C drugs, category D drugs show evidence of risk and drugs from both categories can be used if potential benefits outweigh the risks.[3]

Patients adherence to medication is largely affected by their beliefs about medications,[4] which in turn may be influenced by knowledge of drugs and their safety. Women could avoid medications during pregnancy if they believe it would affect the fetus.[5,6] This becomes a problem when the health of the mother and baby is threatened by disease conditions warranting medications. On the other hand, poor knowledge of medication safety and restriction in pregnancy would lead to self-medication, poor drug use, and associated adverse effects, including fetal deformation, loss of wanted pregnancy, maternal bleeding, and even death.[7] A high proportion of pregnant women use one or more drugs during pregnancy, including supplements and herbal medications.[8,9] A retrospective study of drug utilization in a Nigerian tertiary hospital found that most women are prescribed antibiotics and antimalarial and the third trimester accounts for the majority of the prescriptions.[10] Estimates of prevalence of drug use from previous studies vary from about 25% to 93%.[11–14] Therefore, it is pertinent that pregnant women have adequate knowledge and positive attitude toward safe medication use in pregnancy.

Studies have evaluated the knowledge and attitude of pregnant women regarding medication use in pregnancy across the globe, including in India,[15] Saudi,[16] Norway,[17] Serbia,[18] USA,[19] Malaysia,[20] and Tanzania.[21] All of these studies have reported varying knowledge levels and different attitudes and beliefs toward medication use during pregnancy. About 30% of Tanzanian pregnant women know about some drugs contraindicated/restricted in pregnancy.[21]

The lack of understanding and adherence to medication restrictions can lead to negative health outcomes for both the mother and the baby. Therefore, there is a need to investigate the knowledge, attitude, and practice of pregnant women regarding medication use and restrictions to develop targeted interventions and improve maternal and fetal health outcomes. The present study aimed to assess Nigerian pregnant women's knowledge, attitude, and practice regarding the use of drugs and restriction/contraindications in pregnancy and to determine any association between socio-demographic factors and their knowledge, attitude, and practice.

2. Methods

This was a descriptive cross-sectional study conducted among pregnant women who visited the antenatal clinic (ANC) unit of Federal Medical Center, Umuahia, southeast Nigeria. The medical center is a federal hospital located in the heart of Umuahia city, the capital of Abia State, Nigeria, and operates several units, including the antenatal, postnatal, and child welfare clinics. The antenatal care unit provides care to perinatal mothers who visit the hospital from within and outside the town.

All pregnant women who visited the hospital for their routine check-up during the study period, between January and February 2023 (5 weeks), were included.

A sample size of 218 was determined using the Raosoft® online calculator, with a 95% confidence level, a 5% margin of error, and assuming a 50% response distribution. To compensate for non-response and incomplete submissions, 250 questionnaires were distributed and included in the final survey. The pregnant women who agreed to participate were sampled using a convenient sampling technique.

The study employed a 31-item self-administered anonymous questionnaire adopted from previous similar studies.[16,22,23] The questionnaire was composed of closed-ended questions divided into four sections.

Section A (9 items) contained information about the participant's socio-demographic characteristics. Section B (8 items) assessed their knowledge of medication use and restriction, section C (8 items) assessed their attitude, and section D (6 items) assessed their practice of medication use and restriction in pregnancy. The questionnaire was pretested on 10 pregnant women to ensure adequate understanding and interpretation of the study and were later excluded from the final analysis.

For the knowledge questions, pregnant women indicated their knowledge by answering "true", "not sure", or "false". The attitude variables were evaluated on a four-point Likert scale; in which they indicated if they "strongly agree", "agree", "strongly disagree", or "disagree". The practice was assessed on a binary response scale with "yes" (coded as 1) or "no" (coded as 0) options. To calculate the knowledge scores, a score of "1" was given for the right answers and "0" for "not sure" and "false" options. In attitude, strongly agree, agree, disagree, and strongly disagree were assigned 1,2,3,4 respectively. The scoring was reversed for the positively worded attitude variables during analysis. The respondents were categorized as positive attitude and negative attitude. The correct practice variables were assigned "1" and the incorrect answers were assigned "0".

Questionnaires were distributed to the pregnant women during their weekly visits to the hospital for routine check-up until exhaustion. In cases where the women could not read or write, the pharmacists in the unit assisted in reading and explaining the questions to them to respond accordingly.

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 22.0 and summarized with descriptive

statistics into frequency and percentage. The knowledge level was determined after calculating the mean. Those who scored above the mean were ranked as "good knowledge" and those below the mean were categorized "poor knowledge". Similarly, for the attitude variable, those who had the median score of 17 and above were ranked positive attitude and the rest were categorized as negative attitude. The practice level of each respondent was determined by ranking their practice score based on a scale with maximum score of 6. Good practice for a score of above 3 and poor practice for a score of $\leq$3. The association between social and demographic characteristics, knowledge, attitude, and practice was determined using the Chi-squared test and a *P*-value of $<$5% was considered significant.

2.1. Ethical considerations

The Research Committee of the Pharmacy Department waived the need for ethical approval given that the study was not invasive nor sensitive and posed no risk to the participants. The study was observational and conformed with the International Ethical Guidelines for Biomedical Research Involving Human Subjects (1993), respecting participants' autonomy and confidentiality. A written informed consent was obtained from the study participants before issuing the survey instruments and participants who declined to participate were excluded from the study.

3. Results

One hundred and fifty-two (152) pregnant women completed the questionnaire (60.8% response rate). $>$95% of the respondents were married, between the age of 25 to 35 years (70.4%), had a university/bachelor's degree (61.8%), and about 56% were business women. The majority were in their third trimester (55.3%) and have had 1 to 3 pregnancy (45.4%). Majority of the respondents reported having no medical condition in present pregnancy and only 9.2% had hypertension followed by UTI (4.6%) and hypothyroidism (2%). Routine drugs, including Folic acid, Calcium, Ferrous sulfate, Vitamin B complex, and Vitamin C were the most commonly used drugs in $>$80% of the participants. See Table 1.

More than half (64%) of the women had general poor knowledge of medication use and restriction in pregnancy, with many of them demonstrating low knowledge of drug contraindications in pregnancy. However, majority of the respondents (80.9%) knew that all drugs are not the same and some medications may be more suitably used in some stage of pregnancy, 92.1% knew that wrong drug choice can affect the formation of the fetus, and 85.5% knew that some medications cannot be used in pregnancy regardless of the

Table 1
Sociodemographic characteristics.

Socio-demographic variables	n (%)
Age	
18 to 25	18 (11.8)
25 to 35	107 (70.4)
Above 35	27 (17.8)
Marital status	
Single	3 (2.0)
Married	148 (97.4)
Separated/Divorced/Widowed	1 (0.7)
Education	
Primary	0 (0.0)
Secondary	30 (19.7)
University/Bachelor	94 (61.8)
Postgraduate	28 (18.4)
Occupation	
Business	85 (55.9)
Civil servant	56 (36.8)
Health worker	8 (5.3)
Others	3 (2.0)
Duration of present pregnancy	
1st trimester	22 (14.5)
2nd trimester	46 (30.3)
3rd trimester	84 (55.3)
No of Pregnancies/children	
First pregnancy	62 (40.8)
1 to 3 pregnancies	69 (45.4)
Above 3 pregnancies	21 (13.8)

condition (Table 2). When asked to identify the drugs to be avoided, only a few correctly identified some common medications to be avoided in pregnancy (Fig. 1).

The majority of respondents (48.0%) disagreed that it is better to take natural remedies and doctors prescribe too much medications (52.6%). Most of the participants also disagreed they would take medications without the physician's prescription (53.3%), avoid medications because of harming the baby (47.4%), and over 42% disagreed that there should be no restriction of drugs because the baby needs it. About 61% strongly agreed that they would verify the safety of drugs before taking it (Table 3). Overall, >60% (64.5%) of the respondents had positive attitude to medication use and restriction.

The participants had good practice of medication use and restriction during pregnancy as most (73.0%) did not take routine drugs or over-the-counter drugs without asking the doctor or pharmacist, saw the doctor to obtain a prescription before taking any medication (94.7%), asked about the safety of the drug (95.4%), and checked the leaflet of the drug to know if pregnant women could take it (92.8%). About 95% of the respondents asked the pharmacist for advice regarding the medications they took. Overall, 91.4% demonstrated good practice of medication use and restriction (Table 4).

No sociodemographic variables were associated with respondent's knowledge, attitude, and practice of medication use and restrictions in pregnancy.

Participants were to indicate true, not sure, or false for the listed drugs to determine their knowledge of some drugs to be avoided in pregnancy. Paracetamol and amoxicillin are safe to use in pregnancy and were added to the questions to minimize response bias.

4. Discussion

This study evaluated the knowledge, attitude, and practice of medication use and restriction/avoidance/contraindication during pregnancy among pregnant women who visited a Nigerian federal medical center. The majority of the surveyed pregnant women used one or more drugs during pregnancy but only a small proportion reported having hypertension, UTI, and other medical conditions requiring medication. Other than having a serious health issue, many pregnant women may require the use of medication to stay healthy during gestation. Routine administration of certain vitamins, calcium, iron, and supplements may become necessary for overall health. This finding is similar to previous studies, including a multinational study, which reported that 81.2% of pregnant women in Europe, North and South America, and Australia[24] and 82.5% in the United States[25] used one or more drugs in pregnancy. In addition to routine medications, several conditions may occur during the course of pregnancy resulting in the use of prescription and OTC drugs. In some cases, pregnant women may use unnecessary and inappropriate social drugs, which could harm the fetus and the mother.[26] It is pertinent that pregnant women always discuss their medications with the physician or the pharmacist before using them to ensure safety for both the mother and the baby.

Generally, participants showed poor level of knowledge about medication use and restriction during pregnancy. These findings are comparable to studies in India[15] and Malaysia[20] but differs from Saudi[16] and USA studies,[19] where participants exhibited good knowledge. A large proportion of the participants were unsure about the medications to be avoided in the course of their pregnancy. A similar finding was observed in a recent study in Ethiopia reporting that >90% of pregnant individuals had no knowledge of drugs to be avoided in pregnancy.[22] In a Tanzanian study, only about 30% of the pregnant women knew about some drugs restricted in pregnancy.[21] This contradicted the report demonstrating that 60% of women in a Saudi study correctly identified some common drugs to be avoided in pregnancy according to FDA classification.[16] Participants' low knowledge level could be attributed to some of the socio-demographic variables as majority of the respondents were business women with little knowledge of drugs. Contrary to the Saudi study by Zaki & Albaraq (2014) that had a high proportion of health workers as respondents, which significantly impacted their high knowledge. Other studies have demonstrated that age, education, and occupation are important factors influencing pregnant women's knowledge, attitude, beliefs, and practice toward medication use during pregnancy,[15,20] however, these results were not significant in our study. Future studies should focus on identifying and addressing the factors impacting women's knowledge of medications. In order to improve women's knowledge of medication use and avoidance during pregnancy, it is necessary to provide credible and accessible drug information sources and educational interventions during routine check-ups. Before and during drug dispensing, pharmacists should provide medication counselling to not only pregnant women, but to all women of child-bearing age. Counselling also has a significant impact on improving women's knowledge, attitude, and practice of pregnancy medication use.[27]

Many of the respondents had overall positive attitude but a few were skeptical about taking medications because of perception of harm or risks to the baby. This corroborates with previous similar studies where pregnant women had positive attitude regarding medication use but believed women should be cautious of using medications during pregnancy.[16,19,22] This implies that some women believe that medications may pose considerable risk to the fetus. This subpopulation of women could potentially benefit from

Table 2
Knowledge of pregnant women regarding medication use and restriction in pregnancy.

Statement	True	Not sure	False
Any medication can be used at any stage of pregnancy	6 (3.9)	125 (81.6)	22 (14.5)
Some medications may be more suitable to be used during some stage of pregnancy	123 (80.9)	19 (12.5)	10 (6.6)
A non-prescribed medication can be used during pregnancy	14 (9.2)	13 (8.6)	125 (82.2)
Wrong drug choice can affect the formation of the fetus and health of the mother	140 (92.1)	6 (3.9)	6 (3.9)
The pharmacist should provide all necessary information and advice regarding the medication before using it	139 (91.4)	8 (5.3)	5 (3.3)
It is safe to take common medications and over the counter drugs without the physician or pharmacist's advice	12 (7.9)	25 (16.4)	115 (75.7)
Some medications should never be used in pregnancy regardless of the condition	130 (85.5)	15 (9.9)	7 (4.6)

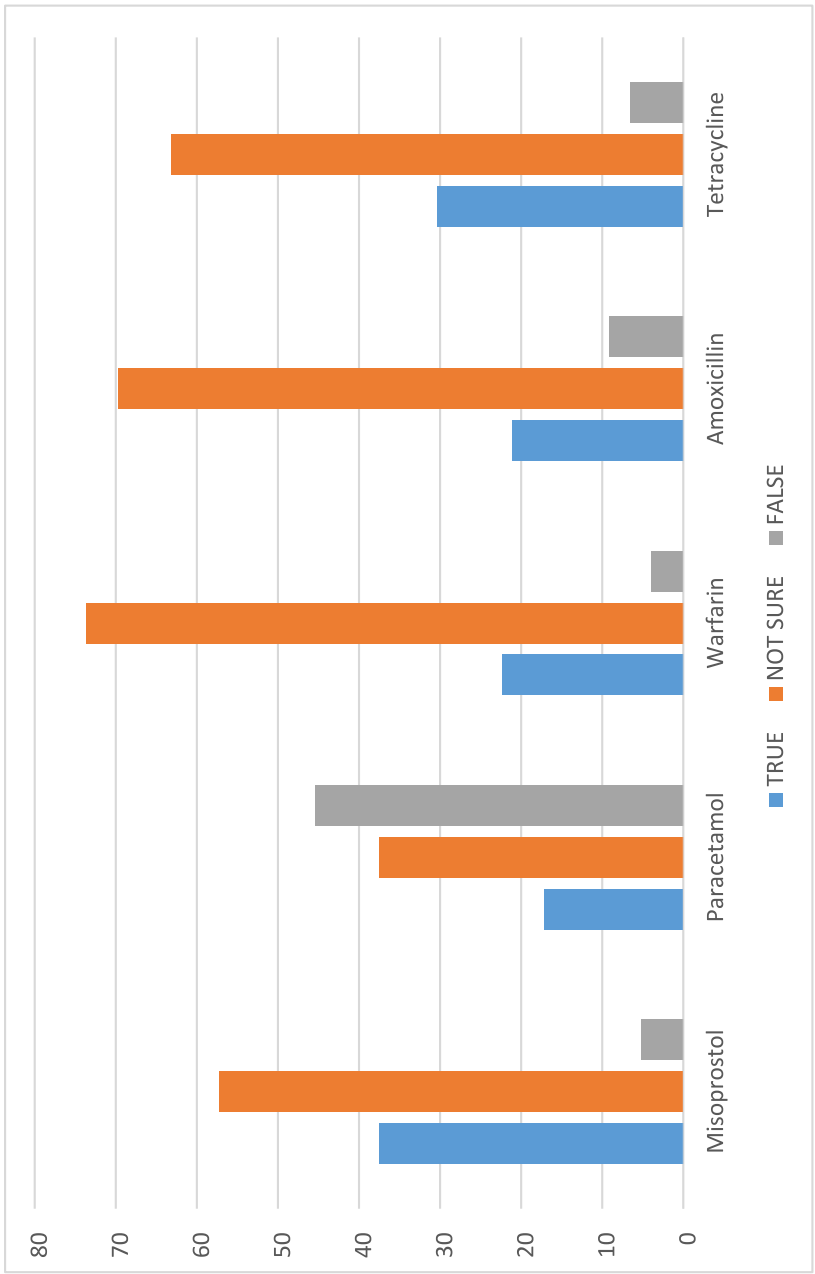

Fig. 1. Knowledge of some common medications to be avoided.

Table 3
Attitude of pregnant women regarding medication use and restriction.

Statement	SA	A	D	SD
	n (%)	n (%)	n (%)	n (%)
Take medication without physician's prescription	4 (2.6)	13 (8.6)	81 (53.3)	54 (35.5)
Verify the safety of medication before taking them	93 (61.2)	46 (30.3)	7 (4.6)	6 (3.9)
Doctors prescribe too much medications	11 (7.2)	18 (11.8)	80 (52.6)	43 (28.3)
All medications are the same and can be used in pregnant women	4 (2.6)	6 (3.9)	70 (46.1)	72 (47.4)
Avoid medications during pregnancy because drugs are harmful	12 (7.9)	20 (13.2)	73 (48)	47 (30.9)
Avoid medications because of the risk to my baby	15 (9.9)	30 (19.7)	72 (47.4)	35 (23.0)
There should be no restriction of drugs during pregnancy because the baby needs it	26 (17.1)	24 (15.8)	64 (42.1)	38 (25.0)
It is better to take natural remedies during pregnancy	12 (7.9)	34 (22.4)	73 (48.0)	33 (21.7)

SA: Strongly agree, A: Agree, D: Disagree, SD: Strongly disagree. Overall, 64.5% of the respondents had good attitude of medication use and restriction.

Table 4
Practice of pregnant women regarding medication use and restriction.

Variables	Yes	No
	n (%)	n (%)
Took routine medications without asking your doctor or pharmacist	41 (27.0)	111 (73.0)
Took over-the-counter drugs without asking your doctor or pharmacist	20 (13.2)	132 (86.8)
Saw your doctor to obtain a prescription before taking any medication	144 (94.7)	8 (5.3)
Asked about the drug to know if pregnant women could take it	145 (95.4)	6 (3.9)
Checked the leaflet of the drug you take to know if pregnant women could take it	141 (92.8)	11 (7.2)
Asked the pharmacist for advice regarding the safety of the medications you take during pregnancy	144 (94.7)	7 (4.6)

91.4% of the participants had good practice of medication use and restriction during pregnancy.

educational interventions to broaden their knowledge and improve their perception of medications and its safety during pregnancy.

Our results showed that majority of the pregnant individuals adopted a good practice of medication use and restriction during pregnancy. Many of the participants reported asking the pharmacist for advice regarding the safety of medications they took during pregnancy. Pharmacists are drug information experts and can play critical roles in counselling pregnant women on safe drug use and responding to their concerns about medication avoidance and symptoms.[28] Previous studies have shown that pregnant women trust medication information from pharmacists.[29] Notwithstanding, a considerable proportion of the respondents still reported that they took routine and over-the-counter medications without prescription from the doctor or pharmacist's advice. This result is worrisome given that some over-the-counter drugs, including analgesics may not be safe and could harm the fetus.[30] Hence, there is a need for increased awareness programs to promote practice of safe drug use among this population.

The study had some limitations. It utilized a small sample size and was conducted in a single federal hospital with participants who visited the facility during the one-month study period. Therefore, the findings may not be representative of the general population and generalization should be done with caution. To the best of our knowledge, this is the first study evaluating Nigerian pregnant women's knowledge, attitude, and practice of medication use and restriction or avoidance during pregnancy. Our findings could be used to inform development of interventions and future studies looking to assess similar parameters with a more robust sample, wider reach, and longer duration.

5. Conclusion

The level of knowledge of medication use and restriction/contraindication among pregnant women who participated in this study was poor. Many of the participants had positive attitude regarding medication use and restriction and about 91% adopted general good practices. There is a need to educate pregnant women on safe medication use and avoidance during pregnancy. Pharmacists in every setting should provide medication advice to pregnant women and women of child bearing age during drug dispensing. As some pregnancies may not be evident, particularly at the early stages, it is good practice to inquire from women about their pregnancy status and offer medication counselling before issuing drugs to them.

Submission statement

This work has not been published previously or is under consideration for publication in any journal and if accepted, will not be published elsewhere. All authors have read and approved this manuscript for publication.

Declaration of Competing Interest

All authors declare no conflict of interest.

Acknowledgements

The authors are grateful to Dr. Ifuoma Iwe for her invaluable assistance in refining the concept of this research. This work was presented at one of the clinical meetings of the Department of Pharmacy, FMC, Umuahia.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.rcsop.2023.100308.

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