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Exploring the need for preconception care: the pregnancy experiences of women with pre-existing medical conditions in Ibadan, Nigeria

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Oludoyinmola O Ojifinni[1], Latifat Ibisomi[2,3]*

Wits School of Public Health, University of the Witwatersrand, Johannesburg, South Africa[1]; Division of Epidemiology and Biostatistics, Wits School of Public Health, University of the Witwatersrand, Johannesburg, South Africa[2]; Nigerian Institute of Medical Research, Lagos, Nigeria[3]

***For Correspondence:** Email: *oludoyinmola@gmail.com*; Phone: +234 803 4739 283

Abstract

Pre-existing medical conditions predisposing to poor maternal and child health outcomes are amenable to preconception care (PCC). Despite an increasing pool of women of reproductive age with pre-existing medical conditions, PCC services are not provided routinely in Nigeria. This study explores the pregnancy experiences of women with pre-existing medical conditions to make a case for PCC services. Nine women having pre-existing medical conditions were purposively selected for in-depth interviews at two referral hospitals for maternal and child health services in Ibadan North LGA, Oyo State, Nigeria. Thematic analysis was done using MAXQDA 2018. There were seven pregnant and two non-pregnant participants having either hypertension, diabetes mellitus, sickle cell disorder, chronic hepatitis, HIV, or secondary infertility. None of the participants were aware of PCC and although they all desired their current pregnancy, there was no active preparation: they neither notified their health care providers about their desire for pregnancy nor had their medications adjusted or changed till after pregnancy. All except one of the participants believed they could have benefitted from PCC if they had been aware before pregnancy. The regular contact with the health system afforded by their pre-existing medical conditions is an opportunity for participants to have been adequately prepared for pregnancy through counselling, adjustment or change in treatment to prevent complications. This opportunity was missed among the study participants. Health care providers need to be proactive and ask women of reproductive age about their pregnancy desires during routine clinic visits in order to make adequate preparation. *(Afr J Reprod Health 2021; 25[2]: 28-38).*

Keywords: Pregnancy desire; preparation for pregnancy; opinion about preconception care; benefit of preconception care

Résumé

Les conditions médicales préexistantes prédisposant à de mauvais résultats pour la santé maternelle et infantile se prêtent aux soins avant la conception (PCC). Malgré un nombre croissant de femmes en âge de procréer avec des conditions médicales préexistantes, les services de PCC ne sont pas fournis systématiquement au Nigéria. Cette étude explore les expériences de grossesse des femmes ayant des conditions médicales préexistantes pour plaider en faveur des services de PCC. Neuf femmes ayant des conditions médicales préexistantes ont été sélectionnées à dessein pour des entretiens approfondis dans deux hôpitaux de référence pour les services de santé maternelle et infantile à Ibadan North LGA, État d'Oyo, Nigéria. L'analyse thématique a été réalisée à l'aide de MAXQDA 2018. Il y avait sept femmes enceintes et deux non enceintes souffrant d'hypertension, de diabète sucré, de drépanocytose, d'hépatite chronique, de VIH ou d'infertilité secondaire. Aucune des participantes n'était au courant de la PCC et bien qu'elles souhaitaient toutes leur grossesse actuelle, il n'y avait pas de préparation active: elles n'ont pas informé leurs fournisseurs de soins de santé de leur désir de grossesse et leurs médicaments n'ont été ajustés ou modifiés qu'après la grossesse. Toutes sauf une des participantes pensaient qu'elles auraient pu bénéficier du PCC si elles en avaient été informées avant la grossesse. Le contact régulier avec le système de santé, grâce à leurs conditions médicales préexistantes, est l'occasion pour les participantes d'avoir été correctement préparées à la grossesse grâce à des conseils, à des ajustements ou à un changement de traitement pour éviter les complications. Cette opportunité a été manquée parmi les participants à l'étude. Les prestataires de soins de santé doivent être proactifs et interroger les femmes en âge de procréer sur leurs désirs de grossesse lors des visites de routine à la clinique afin de se préparer adéquatement. *(Afr J Reprod Health 2021; 25[2]: 28-38).*

Mots-clés: Désir de grossesse; préparation à la grossesse; opinion sur les soins avant la conception; bénéfice des soins préconception

Introduction

Preconception care (PCC) is defined as any intervention provided to women, men and couples of childbearing age, regardless of pregnancy status or desire, before pregnancy, to improve health outcomes for women, newborns and children[1,2]. PCC services aim to detect, treat, or counsel about pre-existing medical, social, and behavioural conditions that may impede positive reproductive outcomes. Medical conditions that are amenable to PCC include non-communicable diseases like hypertension and diabetes, genetic disorders including sickle cell and thalassaemia, infectious disease including Hepatitis B and C, sexually transmitted infections including HIV[3,4]. Also included within the coverage of PCC are lifestyle modifications such as reduction of alcohol intake, and cessation smoking and other substance use, encouraging a healthy diet and exercise[5,6]. Addressing these conditions in the preconception period ensures optimal health before pregnancy occurs and improves the chances of a positive outcome for the mother and child[7,8].

Low and middle income countries (LMIC) particularly in Asia and sub-Saharan Africa have the poorest maternal and child health indices globally[9]. Many of the predisposing factors to poor maternal and child health outcomes are due to diseases amenable to PCC. However, PCC services are either non-existent or weak in many LMICs. Studies from Jordan, Iran, Sudan, Ethiopia and Nigeria show low awareness and utilisation of PCC services[10–18]. In these studies, utilisation of PCC was influenced by health care providers' provision of PCC information, presence of chronic medical conditions and sociodemographic factors including educational and wealth status.

In Nigeria, there is an increasing pool of women with pre-existing medical conditions that require PCC[19,20]. Hypertension, which had a prevalence of 25.2% among women is the most common non-communicable disease in Nigeria[21]. Diabetes mellitus has a prevalence ranging from 8 to 10% in the country[20] while the reported prevalence of gestational diabetes is 13.9% among urban women[22]. About a quarter of the Nigerian population have the sickle cell trait while the estimated prevalence of sickle cell disease is 2%[21]. The maternal mortality ratio in the 2018 demographic and health survey is 512/100,000; 67% of pregnant women received antenatal care and only 43% had skilled birth attendants at delivery[23]. The use of PCC has been shown to be significantly associated with timely antenatal care which is linked with improved birth preparedness and better maternal and child health outcomes[24]. PCC is identified as a primary prevention strategy for prevention of mother to child transmission of HIV in the Nigerian National Guidelines for the Prevention of Maternal to Child Transmission of HIV[25]. The guidelines however do not state any implementation strategy and the country has no specific PCC guidelines[25]. PCC services are therefore provided in an opportunistic manner when health care providers see the need for it[18,26]. This article is part of a larger study that explores the need for and feasibility of PCC services in Nigeria. To achieve the broader aim, this study explores the need for routine PCC services in the country through the pregnancy experiences of women with pre-existing conditions who may have benefitted if such a service was available.

Methods

Study design and setting

This exploratory qualitative study used a case study research design. Case study research is appropriate for exploring naturally occurring events in a contemporary setting when the boundaries between the phenomenon being studied and its context are not clearly evident[27–29]. The case may be single or multiple (for comparison) and may be individuals, communities, events, or processes existing within a bounded system defined by certain predefined parameters[27,29]. The issue illustrated in this study is the need for preconception care within the Nigerian health system. The parameters within which the cases were bounded was their experience of pre-existing medical conditions in pregnancy found commonly in pregnancy within the country. These pre-existing conditions include diabetes mellitus, hypertension, and sickle cell disorder[19–21]. The study was conducted in the obstetric and gynaecological clinics and lying-in wards of two hospitals in Ibadan North LGA of Oyo State, southwest Nigeria. The

first, Adeoyo Maternity Hospital is a secondary health facility while the second, University College Hospital (UCH), Ibadan is a tertiary health facility. Both facilities are referral centres for maternal and child health services in the state while the UCH also provides referral services in maternal and child health for most of the south western region of the country and beyond.

Participant characteristics and sampling

Using pre-existing medical conditions in their previous or current pregnancy as parameters bounding the cases, women aged 18 to 49 years were purposively selected from the obstetric or gynaecological clinics or the lying-in wards. Pre-existing medical conditions commonly occurring among women of reproductive age in southwest Nigeria include hypertension, diabetes mellitus and sickle cell disorder[19–21]. These were represented among the study sample along with chronic hepatitis, HIV, previous pregnancy loss of unknown cause and secondary infertility.

Data collection

Data collection held between June and December 2019 was through one-on-one in-depth interviews conducted by three research assistants supervised by the first author. The research assistants were female resident doctors in Community Medicine in the UCH and the interview schedules were constrained by work commitments hence the need for three interviewers. Each person was responsible for only three interviews. They were familiar with qualitative data collection and were trained for the purpose of the study. Neither the first author nor the research assistants had any prior engagement with the participants before the interviews. The participants were identified with the assistance of chief nursing officers, also females, in the obstetrics and gynaecology department of the hospitals. They were then approached by the research assistants and invited to participate in the study. Everyone who was invited accepted to participate in the study. The plan was to conduct a minimum of five interviews and for the data collection to continue until saturation was reached. After nine interviews, responses to interview questions were similar despite the differences in pre-existing medical conditions among the participants and the interviews were discontinued. The interviews held in private rooms provided by the chief nursing officers who assisted with case identification in the obstetric or gynaecological clinic or the lying-in ward of the two hospitals.

Interview guides based on literature were used for the interviews. The interview guides were pretested with two women at Adeoyo Maternity Hospital, facilitated by one of the research assistants. Both women were in their 50s and identified by the chief nursing officer at the clinic as having experienced pre-existing medical conditions in pregnancy. The questions that were unclear to the participants or generated ambiguous responses were rephrased after the interviews. The main interview questions are shown in Table 1. All the interviews were digitally recorded and lasted an average of 30 minutes. The interviewers made field notes during the interviews.

Data management and analysis

The audio recordings were transcribed verbatim by the first author, reviewed by the interviewers, and integrated with the field notes to ensure all information was adequately captured. Thematic analysis was done by the first author using a hybrid of deductive and inductive coding[30,31]. Analyst triangulation was done to improve credibility with an independent researcher who was not a part of the research team coding two of the nine transcripts[32,33]. The coding was done manually at this point and the total of 26 codes derived from the data were merged into six themes. Both coders met to review the codes, reached an agreement on code definitions and rules, and merged the codes into themes. These themes made up the codebook which was applied to the rest of the data by the first author. The transcripts were imported into MAXQDA 2018 qualitative data analysis software for further analysis.

Results

Participants' sociodemographic characteristics

Nine transcripts were analysed with the mean age of the participants being 36.2±3.7 years. All the participants had completed secondary education and

Table 1: Interview questions

S/N	Questions	Probes
1.	Please describe your experience during your most recent pregnancy	Did you want to be pregnant at the time or would you have wanted to delay it a little? Why? Did you receive any special care at the time? Why and for what? Were you healthy or ill? What medications were you using? Did they need to be changed or adjusted? Why?
2.	What is your understanding of preconception care?	What does the term mean to you? Who needs such care and for what?
3.	Then, a description of PCC from literature was provided after which participants were asked: Can you describe your understanding of this concept before or around the time of your pregnancy?	In what way could an understanding of preconception care have helped you at the time, if at all? Would you say it could have helped your preparation for pregnancy in any way? Could your attitude to your treatment have been different in any way? Are there any consequences you have experienced that could have been avoided if you knew about and used preconception care? Please provide details.

Table 2: Sociodemographic characteristics of the participants

Code*	Age	Number of		Medical problem	Pregnancy Status
		Previous pregnancies	Living children		
PW1	37	3	1	HIV	Pregnant
PW2	38	1	2	Hypertension	Pregnant
PW3	30	1	1	Chronic Hepatitis	Pregnant
PW4	40	3	3	Diabetes Mellitus	Pregnant
PW5	38	3	0	Hypertension	Pregnant
PW6	41	4	3	Hypertension & Diabetes	Pregnant
PW7	33	3	0	Sickle cell disorder	Pregnant
NPW1	32	2	1	Previous pregnancy loss of unknown cause	Not pregnant
NPW2	37	2	0	Teenage pregnancy & Secondary infertility	Not pregnant
Mean	36.2 ±3.7	2.4 ± 1.0			

*PW – Pregnant woman; NPW – Nonpregnant woman. Also used in the results

Table 3: Themes identified from the data

Theme	Description
Awareness about preconception care	Participant's awareness about preconception care. Includes responses stating knowledge of preconception care as a concept. Also includes description or opinion about awareness of preconception care in general
Desire for pregnancy	Participants state whether they desired their most recent pregnancy.
Preparation for pregnancy	Descriptions participants give about what they did either medically or in their homes as part of self-care in preparation for pregnancy. Includes description of visits to health facilities or discussion with medical personnel about what they needed to do while preparing for pregnancy.
Use of medications before and during pregnancy	Includes participants' description of the treatment they received for any pre-existing medical ailment; medications taken etc. before pregnancy. Also includes adjustments to treatment while planning for pregnancy and after they found out they were pregnant.
Opinion about preconception care	Participant's opinion about what preconception care is. Includes definitions, descriptions, and perceptions. Also includes description of who requires preconception care, and conditions in which it is required.
Potential benefit of preconception care	Participant's description of how preconception care could have helped them in previous pregnancies if they had been aware of and/or used the service. Includes descriptions of experiences that could have been avoided or mitigated by preconception care. Also includes opinions on whether or not participants believe preconception care is necessary for them as individuals.

were employed at the time of the study. Although all the participants were married, one of them had experienced teenage pregnancy before she got married and that was the pregnancy of reference at her interview. Seven of the women were pregnant at the time of their interview. The mean number of previous pregnancies was 2.4±1.0 while the modal number of living children was one with three women having no living child at the time of the interview. Further details of the participants' characteristics are shown in Table 2.

Study themes

An initial set of 26 codes were identified from recurring patterns in the data which were merged into six themes through discussion to arrive at a consensus. The six themes identified are shown in Table 3.

Awareness about preconception care

When asked to describe what they considered PCC to be, most of the participants stated that they were unaware of the concept.

> *I'm not aware of it. In fact, this is my first time of hearing anything about this*. – **PW1**

When they were given the description of PCC, one of the participants said, "*but we don't do that*" while all the others declared "*I've not heard of that before*". Only one participant remembered being told about something similar during a previous pregnancy.

> *I heard of something like this in the hospital during my last pregnancy about 6 years ago*. – **PW4**

A participant said she realised her need for care before pregnancy when she had a spontaneous abortion. Before then she believed there was no need to seek medical attention before pregnancy. Her comment highlights the anecdotal report of beliefs within the community that pregnancy is expected after marriage and requires no intervention.

> *I didn't know I was supposed receive any care before pregnancy. After marriage, the next thing is pregnancy. I believe that it's those who are unable to conceive that should seek for care. Once a woman can conceive, she doesn't need any care. But a woman who has delays needs to go for medical check-up. It was not until I had miscarriages that I realised I needed to come to the hospital to find out what I needed to do or to avoid*. – **NPW1**

Desire for pregnancy

All the participants stated that they desired their current pregnancy while those who were not pregnant at the time of the study expressed their desire for pregnancy.

> *I wanted the pregnancy at the time it came, even before that time because I had lost two pregnancies earlier*. – **PW6**

In support of their desire for pregnancy, two of the participants had discontinued the family planning method they had been using in anticipation.

> *I had been using family planning for seven years, but I stopped a year ago because we wanted another baby*. – **PW2**

Although they desired and planned to have another pregnancy, two of the participants stated that the timing was not in keeping with their desire. They had given up on their expectation for pregnancy when they finally became pregnant.

> *I wanted it, but I was not expecting it at this time. When I was pregnant in 2015, I expected and desired to get pregnant. But when the child became ill and died in 2016, I took my mind off having more children. I only prayed that God should keep the ones that are alive, but God knows the reason for this current pregnancy. I believe it is God's will*. – **PW6**
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> *The pregnancy just came. I was planning and preparing for it, but it did not come on time as I expected. It just came suddenly*. – **PW4**

Preparation for pregnancy

Preparations for pregnancy differed among the participants depending on their previous pregnancy experiences. Although all the participants stated that they had planned for their current pregnancies, special preparation for pregnancy were only described by those who had experienced

complications in their previous pregnancies or had delay in achieving conception. For instance, one of the participants sought information on the internet because of her previous experience.

> *During my first pregnancy, my blood pressure became very high when I was around 7 months pregnant. I had eclampsia and became unconscious. I was referred to this hospital from the one I used close to my house. After the delivery, when I came out of coma the doctors told me I should have come earlier, and they would have given me some drugs. So, when we planned for this pregnancy, myself and my husband did a research on what happened then so that it will not happen again. We googled it at home and printed out the information, so we were fully prepared.* – **PW2**

Another participant who had lost a child after birth sought medical care because she thought the baby died due to complications of fibroids that were discovered while she was pregnant. In order to avoid a recurrence, she sought medical care only to be diagnosed with hypertension and diabetes for which she was receiving treatment when she became pregnant again.

> *The baby I had in 2015 died in 2016. During the pregnancy I found out I had fibroids. So, after I had rested from all the stress of the baby's death, I came to the hospital because I thought the fibroids affected the baby and caused the sickness and led to the death. I decided to come and take care of myself so that the same thing will not happen again. When I was examined, it was discovered that my blood pressure was high, and I could not have the operation for the fibroids then. I was referred to the medical clinic for treatment. There, some other tests were done it was discovered that I have diabetes. I started treatment for both hypertension and diabetes*. – **PW6**

One participant who had experienced delay in getting pregnant sought medical help to determine the cause of the delay.

> *I've had two pregnancies before now, the first one was a miscarriage at 3 months, then I had a delay of about 3 years before the second pregnancy. So, I went to the hospital to find out what was causing the delay then. That's the same reason why I came to the hospital now because it's now about 9 years since I had my second pregnancy.* – **NPW2**

Use of medications before and during pregnancy

Those among the participants who had medical conditions that required treatment had been on medications. While some needed their medications to be changed or the dosage adjusted because of its potential impact in pregnancy, others did not. None of the participants informed their doctor of their desire for pregnancy however and change in medication was only effected during pregnancy for those who needed it.

> *I have been on mediations for HIV and the doctors have told me that it is safe for me to continue to use them even now that I am pregnant*. – **PW1**
>
> *I did not tell my doctors that I desired to get pregnant. I was using medications for blood pressure and diabetes, but I was told to stop the blood pressure medications because it is now controlled. I am also using thyroid medications because it* {the thyroid} *was removed surgically. My diabetes medication was changed to insulin injection after I got pregnant because the doctor said those medications are not safe in pregnancy.* – **PW6**
>
> *I have sickle cell disorder, but I haven't been on any medications apart from the routine paludrin* {malaria prevention drugs} *and folic acid because I haven't had any crisis for the past 4 years.* – **PW7**

Opinion about PCC

While some of the participants expressed the opinion that PCC is beneficial for everyone and awareness should be raised about it, others believed that the benefits are not for everyone. Those with latter view stated that PCC may be of greater benefit to those who are unable to achieve conception spontaneously.

> *The way I understand it, particularly for someone who has gone through the kind of*

health challenges I've had, if one wants to get pregnant it is better to let one's doctor know about it. That way everything necessary would have been done to control all that the person is going through. They will be able to say what is the best time to get pregnant so that mother and the child will not be affected negatively. Awareness needs to be raised about this in our communities. – **PW6**

I understand that PCC is good especially for the baby, like now I was told that the folic acid is very important for the baby especially for their spinal cord and their brain. But to me not everybody needs PCC because our body system is not the same. Some people will have to see gynaecologists and maybe use fertility drugs. Other people won't even look for the pregnancy before they have it. – **PW7**

Potential benefit of PCC

The participants expressed varied views on potential benefits of PCC to their health conditions. Most stated they would have benefitted either through having better information and treatment or delaying pregnancy to address potential complications. One of the participants however felt she had no need for PCC because in spite of her medical health status, she had experienced no complications that PCC could have prevented.

If I had known about PCC before now, I would have considered giving more gap before having this pregnancy. Then I could have been treated for the hepatitis before getting pregnant. I've just been told in the clinic that I can't take the medications again until after delivery. Then they will have to treat the baby too. I would have avoided all that if I had known. – **PW3**

I think knowing about PCC would have helped me at the time I had my first pregnancy. I was a teenager then and my partner wanted a child. But I hadn't even completed my National Diploma and I didn't understand much. Maybe I would have delayed then, and things would have been different now. – **NPW2**

I don't think knowing about PCC could have helped me in any way because to me I have no issues. Yes, I have sickle cell, but I don't see it as a problem and my husband too doesn't have any problem. The two pregnancies I lost; I think it was due to the carelessness of the people in the private hospital I used then because they couldn't tell me what actually went wrong. That's why I said I don't think PCC would have helped me. – **PW7**.

Discussion

This study describes the need for preconception care (PCC) services as part of maternal and child health care within the Nigerian health system using multiple case studies of women who had medical problems in pregnancy. The medical conditions experienced by the women in this study included hypertension, diabetes, HIV, chronic hepatitis, sickle cell disorder, teenage pregnancy, and secondary infertility. These are all conditions that have been shown to be amenable to interventions available through PCC[4,34,35]. Most of the participants were unaware of PCC or its potential benefits to them at the time of their pregnancy. No participant informed their health provider about their intention to conceive and so did not have their medications adjusted where necessary until they were pregnant.

Only one of the nine participants in this study was aware of PCC and she had heard about the concept in the hospital during a previous pregnancy. Previous studies across Africa and Nigeria have shown that many women who are aware of PCC often receive their information from health facilities or health care providers[11–13,17,36,37]. All the participants in this study had been diagnosed with different medical conditions before their pregnancy and had routine clinic visits for follow up. That they were unaware of the concept of PCC and its potential benefit for them implies a possible lack of awareness of the need among their health care providers. A study among health care workers in northern Nigeria showed that less than half of the participants had ever provided PCC[26]. PCC is recognised in the Nigerian National Guidelines for the Prevention of Maternal to Child Transmission of HIV as a primary prevention strategy[25]. However,

the participant who was HIV positive was unaware of PCC, suggesting that the service had not been offered to her at any of her routine clinic visits before she became pregnant. By implication, there is a gap in the care of women of reproductive age who have chronic medical illnesses that should be filled by PCC services. There is a need for increased awareness among health care providers as an important source of information to this group of women. The health care providers' role includes informing women about the risks associated with pre-existing conditions, screening for those who are unaware of their health risks and treatment modification for those who are receiving medications[38,39]. Thus, all health workers need to encourage their clients to discuss their pregnancy plans in order to begin or adjust treatment plans where necessary.

Although all the participants in the study stated their desire for pregnancy, the specific efforts by two participants was discontinuing their contraceptive methods, which is intuitive for anyone who desires pregnancy. Research on pregnancy intentions have shown that women with intended pregnancies are more likely to engage in positive health behaviours like use of vitamin supplements, including folic acid and avoiding alcohol and tobacco use[40,41]. They are also more likely to seek medical interventions and use PCC services in order to avoid potential complications[10,12], a fact that was prominent among the participants in this study who had experienced complications in their previous pregnancies. However, none of the participants told their health providers about their desire for pregnancy, thus missing out on the opportunity to adjust their medications or receive necessary counsel on lifestyle modifications before pregnancy. By implication, health care providers who care for women of reproductive age with chronic medical conditions should ask them about their desire for pregnancy routinely so that they can counsel them and adjust their medications in a timely manner. Beyond addressing known health problems, PCC also includes identification of pre-existing conditions[7,42] and should therefore not be restricted to women who have known complications. The experiences of two of the study participants buttresses this point – one who had chronic hepatitis was only diagnosed in the current pregnancy while another was diagnosed with diabetes in her previous pregnancy. Optimising health in the preconception period through medical screening would have been beneficial in both instances.

The participants expressed different opinions about the possible benefits of PCC to the general population and to themselves with respect to their medical conditions. While most believed that PCC services as described in the interviews would benefit anyone who used it irrespective of pre-existing medical conditions, one of the participants who had sickle cell disorder dissented. She believed that only those who had difficulty with conceiving would need such care. She also stated that in spite of her pre-existing medical condition, PCC would not have helped her in any way. Such dissenting voices need to be identified and targeted information provided on the potential benefits. For instance, in the case of this participant, sickle cell disorder would benefit from premarital counselling and screening[43], as well as optimising the health of the mother in the preconception period because of the documented higher risk of maternal and foetal complications[44,45]. In addition, having preconception care followed by effective antenatal care has been shown to be associated with a reduction in the occurrence of complications among women with sickle cell disorder[45].

Ethical consideration

The participants were provided with information sheets containing the details of the study and provided consent for the interview and audio recording. No identifying information was documented; audio recordings and transcripts were labelled with codes and saved in a password-enabled laptop accessible only to the authors. Ethical approval for the study was obtained from the University of Ibadan/University College Hospital (UI/UCH) ethics committee (Clearance number UI/EC/17/0390), Oyo State Ethics Committee (Approval number AD/13/479/565) and the Wits University Human Research Ethics Committee – Medical (Clearance number M171054).

Study strengths and limitations

The study was strengthened by the training and expertise of the researchers. The first author who was the principal investigator in the study is a Community Physician with several years of experience in clinical management of women of reproductive age. The second author is an epidemiologist of several years, an experienced demographer and population scientist. Their training and experience in addition to academic exposure was an advantage to their understanding and interpretation of the experiences described by the study participants.

In terms of the limitations of this case study research, the parameters within which the cases were bounded did not include sociodemographic characteristics. For instance, the experiences of the study participants may be different from those of women who are single, with lower levels of education or unemployed. The findings may therefore not be transferable beyond the demographics of the study participants.

Conclusion

This study showed a lack of awareness of preconception care (PCC) among a group of women with pre-existing medical conditions who would have benefited from the use of the service. While they all desired pregnancy, none of the participants' preparations included seeking information from their health care providers on what adjustments they may have needed to make to their treatment regimen. This implies a need for health care providers to include specific preconception information in their packages of care for women of reproductive age. There is also a need to improve awareness of the need for PCC among health care providers as they are an important source of information for women in the reproductive age group who have pre-existing medical conditions that can affect pregnancy negatively.

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Contribution of authors

Study conceptualisation and design: both authors; data collection and analysis: OO; manuscript preparation: OO; final write-up, editing and approval: both authors.

Conflict of interest

The authors declare that there were no conflicts of interest in the conduct of this study.

References

1. Dean S V, Mason E, Howson CP, Lassi ZS, Imam AM and Bhutta ZA. Born too soon: care before and between pregnancy to prevent preterm births: from evidence to action. Reprod Health. 2013;10 Suppl 1(Suppl 1):S3.
2. O'Brien AP, Hurley J, Linsley P, McNeil KA, Fletcher R and Aitken JR. Men's Preconception Health: A Primary Health-Care Viewpoint. Am J Mens Health. 2018;12(5):1575–81.
3. Lassi ZS, Imam AM, Dean S V and Bhutta ZA. Preconception care: preventing and treating infections. Reprod Health. 2014;11(Suppl 3):S4.
4. Lassi ZS, Imam AM, Dean S V and Bhutta ZA. Preconception care: screening and management of chronic disease and promoting psychological health. Reprod Health. 2014;11(Suppl 3):S5.
5. Lassi ZS, Imam AM, Dean S V and Bhutta ZA. Preconception care: caffeine, smoking, alcohol, drugs and other environmental chemical/radiation exposure. Reprod Health. 2014;11(Suppl 3):S6.
6. Dean S V, Lassi ZS, Imam AM and Bhutta ZA. Preconception care: nutritional risks and interventions. Reprod Health. 2014;11 Suppl 3 (Suppl 3).
7. Mason E, Chandra-Mouli V, Baltag V, Christiansen C, Lassi ZS and Bhutta ZA. Preconception care: advancing from 'important to do and can be done' to 'is being done and is making a difference.' Reprod Health. 2014;11(Suppl 3):S8.
8. Bombard JM, Robbins CL, Dietz PM and Valderrama AL. Preconception care: The perfect opportunity for health care providers to advise lifestyle changes for hypertensive women. Am J Heal Promot. 2013;27(SUPPL. 3):43–50.
9. Dean S, Rudan I, Althabe F, Webb Girard A, Howson C, Langer A, Lawn J, Reeve ME, Teela KC, Toledano M, Venkatraman CM, Belizan JM, Car J, Chan KY, Chatterjee S, Chitekwe S, Doherty T, Donnay F, Ezzati M, Humayun K, Jack B, Lassi ZS, Martorell R, Poortman Y and Bhutta ZA. Setting Research Priorities for Preconception Care in Low- and Middle-Income Countries: Aiming to Reduce Maternal and Child Mortality and Morbidity. PLoS Med. 2013;10(9).

10. Al-Akour NA, Sou'Ub R, Mohammad K and Zayed F. Awareness of preconception care among women and men: A study from Jordan. J Obstet Gynaecol (Lahore). 2015;35(3):246–50.
11. Ahmed KYM, Elbashir IMH, Mohamed SMIM, Saeed AKM, Alawad AAM, Ahmed YKM, Isra MHE, Mohamed SMIM, Saeed AKM and Alawad AAM. Knowledge, attitude and practice of preconception care among Sudanese women in reproductive age about rheumatic heart disease at Alshaab and Ahmad Gassim hospitals 2014-2015 in Sudan. Basic Res J Med Clin Sci. 2015;4(7):199–203.
12. Demisse TL, Aliyu SA, Kitila SB, Tafesse TT, Gelaw KA and Zerihun MS. Utilization of preconception care and associated factors among reproductive age group women in Debre Birhan town, North Shewa, Ethiopia. Reprod Health. 2019;16(1):1–10.
13. Kassa A and Yohannes Z. Women's knowledge and associated factors on preconception care at Public Health Institution in Hawassa City, South Ethiopia. BMC Res Notes. 2018;11(1):841.
14. Idris SH, Sambo MN and Ibrahim MS. Barriers to utilisation of maternal health services in a semi-urban community in northern Nigeria: The clients′ perspective. Niger Med J. 2013;54(1):27.
15. Roudsari RL, Bayrami R, Javadnoori M, Allahverdipour H and Esmaily H. Patterns and determinants of preconception health behaviors in Iranian women. Iran Red Crescent Med J. 2016;18(12).
16. Onasoga AO, Osaji TA, Alade OA and Egbuniwe MC. Awareness and barriers to utilization of maternal health care services among reproductive women in Amassoma community, Bayelsa State. Int J Nurs Midwifery. 2014;6(1):10–5.
17. Ekem NN, Lawani LO, Onoh RC, Iyoke CA, Ajah LO, Onwe EO, Onyebuchi AK and Okafor LC. Utilisation of preconception care services and determinants of poor uptake among a cohort of women in Abakaliki Southeast Nigeria. J Obstet Gynaecol (Lahore). 2018;38(6):739–44.
18. Akinajo OR, Osanyin GE and Okojie OE. Preconception care: Assessing the level of awareness, knowledge and practice amongst pregnant women in a tertiary facility. J Clin Sci. 2019;16(3):87–92.
19. Adeloye D, Basquill C, Aderemi A V., Thompson JY and Obi FA. An estimate of the prevalence of hypertension in Nigeria. J Hypertens. 2015;33(2):230–42.
20. Ogbera AO. Diabetes mellitus in Nigeria: The past, present and future. World J Diabetes. 2014;5(6):905.
21. Federal Ministry of Health. National Strategic Plan of Action on Prevention and Control of Non-Communicable Diseases. 2015.
22. Macaulay S, Dunger DB and Norris SA. Gestational diabetes mellitus in Africa: A systematic review. PLoS One. 2014;9(6):1–11.
23. National Population Commission (NPC) [Nigeria], and ICF. Nigeria Demographic and Health Survey 2018. Abuja, Nigeria and Rockville, Maryland, USA; 2019.
24. Wally MK, Huber LRB, Issel LM and Thompson ME. The Association Between Preconception Care Receipt and the Timeliness and Adequacy of Prenatal Care: An Examination of Multistate Data from Pregnancy Risk Assessment Monitoring System (PRAMS) 2009–2011. Matern Child Health J. 2018;22(1):41–50.
25. Federal Ministry of Health Nigeria. National Guidelines for Prevention of Mother-to-Child Transmission of HIV (PMTCT). Fourth. Abuja, Nigeria: HIV and AIDS Division, Federal Ministry of Health, Nigeria; 2010. 52–55 p.
26. Adeoye TO, Kolawole AO, Onwuhuafua PI and Adeoye GO. Awareness and perception of preconception care among health workers in Ahmadu Bello University Teaching University, Zaria. Trop J Obstet Gynaecol [Internet]. 2016;33:149–52. Available from: http://www.tjogonline.com/text.asp?2016/33/2/149/192215
27. Yin RK. Case Study Research: Design and Methods. 5th ed. Thousand Oaks, California: Sage Publications Inc.; 2014.
28. Green J and Thorogood N. Qualitative Methods for Health Rersearch. 3rd ed. Seaman J, Mehrbod L, Antcliff I, and Harrison K, editors. Sage Publications, Inc.; 2014.
29. Creswell JW and Poth CN. Qualitative Inquiry and Research Design: Choosing Among Five Approaches. 4th ed. Thousand Oaks, California 91320: Sage Publications Inc.; 2018.
30. Fereday J and Muir-Cochrane E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. Int J Qual Methods. 2017;5(1):80–92.
31. Braun V and Clarke V. Using thematic analysis in psychology. Intergovernmental Panel on Climate Change, editor. Qual Res Psychol. 2006;3(2):77–101.
32. Hastings SL. Triangulation. In: Salkind NJ, editor. Encyclopedia of Research Design [Internet]. 2455 Teller Road, Thousand Oaks California 91320 United States: SAGE Publications, Inc.; 2012. p. 1538–40. Available from: http://methods.sagepub.com/reference/encyc-of-research-design
33. Heale R and Forbes D. Understanding triangulation in research. Evid Based Nurs. 2013;16(4):98–98.
34. Dean S V, Lassi ZS, Imam AM and Bhutta ZA. Preconception care: promoting reproductive planning. Reprod Health. 2014;11(Suppl 3):S2.
35. Dean S V, Imam AM, Lassi ZS and Bhutta ZA. Systematic Review of Preconception Risks and Interventions. 2013.
36. Ayalew Y, Mulat A, Dile M and Simegn A. Women's knowledge and associated factors in preconception care in Adet, West Gojjam, Northwest Ethiopia: a community based cross sectional study. Reprod Health. 2017;14(1):15.
37. Olowokere AE, Komolafe A and Owofadeju C. Awareness, Knowledge and Uptake of Preconception Care among Women in Ife Central Local Government Area of Osun State, Nigeria. J Community Heal Prim Heal Care. 2015;27(2):83–92.

38. Dean S, Bhutta Z, Mason EM, Howson C, Chandra-Mouli V, Lassi ZS and Imam AM. Chapter 3. Care before and between pregnancy. In: CP Howson, MV Kinney, and JE Lawn, editors. Born Too Soon: The Global Action Report on Preterm Birth [Internet]. World Health Organization; 2012. p. 32–45. Available from: http://beforeandbeyond.org/uploads/Born Too Soon.pdf
39. World Health Organization. Meeting to develop a global consensus on preconception care to reduce maternal and childhood mortality and morbidity. WHO Headquarters, Geneva Meeting report. Geneva, Switzerland; 2012.
40. Chuang CH, Hillemeier MM, Dyer AM and Weisman CS. The relationship between pregnancy intention and preconception health behaviors. Prev Med (Baltim) [Internet]. 2011 Jul;53(1–2):85–8. Available from: http://dx.doi.org/10.1016/j.ypmed.2011.04.009
41. Cheng D, Schwarz EB, Douglas E and Horon I. Unintended pregnancy and associated maternal preconception, prenatal and postpartum behaviors. Contraception. 2009;79(3):194–8.
42. Hurst HM and Linton DM. Preconception Care: Planning for the Future. J Nurse Pract [Internet]. 2015;11(3):335–40. Available from: http://dx.doi.org/10.1016/j.nurpra.2014.09.011
43. Lassi ZS, Dean S V, Mallick D and Bhutta ZA. Preconception care: delivery strategies and packages for care. Reprod Health. 2014;11(Suppl 3):S7.
44. Elenga N, Adeline A, Balcaen J, Vaz T, Calvez M, Terraz A, Accrombessi L and Carles G. Pregnancy in Sickle Cell Disease Is a Very High-Risk Situation: An Observational Study. Obstet Gynecol Int. 2016;2016:1–5.
45. Omole-Ohonsi A, Aiyedun T and Ashimi O. Preconception care and sickle cell anemia in pregnancy. J Basic Clin Reprod Sci [Internet]. 2012;1(1):12. Available from: http://www.jbcrs.org/text.asp?2012/1/1/12/104290.