Unsure Last Normal Menstrual Period among Pregnant Women in Low Resource Setting: The Experience from Federal Teaching Hospital Gombe, North-Eastern Nigeria

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Citation: Utoo BT, Farouk HU, Muhammed RL, Bako B, Azeez OA, Joshua TG, Adejoh PF. (2022) Unsure Last Normal Menstrual Period among Pregnant Women in Low Resource Setting: The Experience from Federal Teaching Hospital Gombe, North-Eastern Nigeria. J. *Women Health Care and Issues.* 5(6); DOI:10.31579/2642-9756/133

Abstract

Background: The proper management of any pregnancy depends on the accurate determination of the gestational age. In resource constrained environment where imaging techniques may not be readily available, accessible and affordable, the knowledge of menstrual period is key. Unfortunately, some of the pregnant women at antenatal clinics do not know their last normal menstrual period (LNMP).

Aim/Objectives: This research was designed to ascertain the proportion of women who do not know their LNMP and associated factors.

Materials and Methods: This was a descriptive, cross-sectional study involving antenatal attendees at the booking clinic of the Federal Teaching Hospital Gombe. Data such as socio-demographics, knowledge of dates/associated factors and willingness to remember the menstrual period subsequently was collected through a structured questionnaire from 1st March to 31st August 2022 and analysis done with IBM® SPSS® statistical Inc., Armonk, New York, USA software version 25 for analysis. Qui-square used as a test of statistics and the results presented in charts, graphs and tables.

Results: Out of the 350 respondents 181(51.7%) knew their LNMP, while 169(48.3%) did not know. However, as much as 70.6% of the respondents knew that LNMP is used to date pregnancy. Reasons for not knowing dates included; not just keeping records of dates (25.4%), ignorance of Gregorian calendar (13.0%), on contraceptives when pregnancy was identified (10.7%), no reason (8.3%), was breastfeeding (6.5%), among several others. Surprisingly, 32% did not know the problems that may arise due to ignorance of LNMP. Majority (90.0%) of the respondents are willing to remember their LNMP in the next pregnancy. Women ≤ 19years and ≥ 40 years (p=0.004), lower level of education (p=0.004), Grand-multiparity (p=0.035), more than 4 living children (p=0.02) and rural dwellers (p=0.001) were more likely not to know their LNMP.

Conclusion: The study showed 48.3% of the women were ignorant of their LNMP. The associated factors were extreme of ages, low level of education, grand multi-parity, having more than 4 living children and rural place of residence. Going forward, majority of the women accepted to remember their LNMP.

Key words: antenatal; booking ultrasound; gestational age; menstrual period; pregnancy date; unsure date

Abbreviations

LNMP: Last Normal Menstrual Period

NICU: Neonatal Intensive Care Unit

ANC: Antenatal Clinic

ADHD: Attention deficit Hyperactivity Disorder

USS: Ultrasound Scan

SFH: Symphysio-fundal height

PHC: Primary Health Care

FTHG: Federal Teaching Hospital Gombe

Introduction

The proper management of any pregnancy entails an initial accurate estimation of the gestational age [1]. This is a critical step because, the antenatal visit schedules and some of the interventions depend on the gestational age by date. Also, accurate knowledge of the gestational age allows the Obstetrician to perform certain screening test such as the quadruple test and other laboratory tests at the appropriate time in the course of the pregnancy [1]. The normal period of pregnancy is 40 weeks or 10 lunar months so that knowing the Last Normal Menstrual Period (LNMP) could assist in identifying the expected day of delivery [2]. Optimal first trimester dating will also offer the clinician an opportunity to accurately assess the fetal growth as the pregnancy advances [1, 3].

Accurate dating is also essential for planning the date of surgery for women going for elective caesarean deliveries. The decision of when to give birth should be taken together by the clinician and the patient because babies born earlier than the due date are at increased risk of neonatal morbidity and mortality [3. 4]. They suffer a higher risk for respiratory distress syndrome of prematurity, and are more likely to be admitted and managed in the neonatal intensive care unit (NICU) [3]. Studies have also shown that early term and late preterm infants are more likely to develop attention deficit hyperactivity disorder (ADHD) as a result of probably neurodevelopmental problems. It also creates an emotional and financial burden on the family [3, 4].

Various methods of estimating gestational age are utilized today aside from LNMP. These includes; ultrasound scan, symphysio-fundal height estimation (SFH) and the Ballard score [5]. The SFH is a cheap and feasible alternative, appears more accurate than other non-ultrasound based methods, and is said to predict gestational age at delivery best when sequential measurements are used [5]. The reliability and accuracy of SFH to date pregnancies has been largely characterized as poor in the literature [5].

 Although, early pregnancy ultrasound is considered the gold standard for pregnancy dating and the technology is becoming more affordable and available, access tends to be limited to tertiary centers and private practice especially in low resource climes; the majority of pregnancies are thus dated using other methods [5-8]. For instance, in sub-Saharan Africa, only 7% of pregnant women are estimated to have access to ultrasonography [8]. Although the situation is said to be better now even beyond the African continent. For instance, in India, it is reported that, access to ultrasonography in pregnancy increased from 24% in 2005 to 61% by 2016, although coverage is higher in urban areas and among women from higher wealth quintiles [8].

Even if the challenges of availability and access in our environment are resolved, studies have shown that most women present for booking at late gestations where ultrasound dating of the pregnancy is less accurate [4, 7, 8, 9]. Therefore, the cheaper, commonest and traditional alternative to estimate the gestational age and determine expected date of delivery which is through the Naegele's rule using the LNMP is imperative [8, 10]. LNMP can predict gestational age well if cycle characteristics and the date of onset of the last menstrual bleed can be clearly established, yet this has proven difficult in many low income settings [5, 8, 9]. However, this principle of dating of pregnancy is so simple and can be done by the primary care provider, midwife, nurse practitioner, obstetrician and the obstetric nurses [1].

It is also true that the formula credited to Franz Karl Naegele (1830) has been criticized by other researchers for some observed inaccuracies in estimating expected date of delivery (EDD). The Parikh's formula whose accuracy in dating pregnancy was found to be comparable with that of first trimester ultrasound estimation, could be utilized especially where facilities for ultrasonographic estimation of gestational age are not available (as in most of the rural areas in developing world) [11].

Pregnancy dating with ultrasound is clearly preferred and increasingly available, however, LNMP could be very useful especially among rural and less educated women thereby helping the clinician institute pregnancy interventions that would guarantee better patient management [6, 7]. For this reason, it is proper to ensure that women understand the importance of their LNMP and recall it at booking so as to make dating of their pregnancies as accurate as possible. Surprisingly, we have observed that so many women do not know their LNMP when they come to booking clinic. This observation cuts across different levels of socio-economic status, education, place of residence, occupation and ethnicity [6].

Unfortunately, little attention has been paid to the reasons why women in most cases do not know their LNMP [3]. This research was designed to ascertain the proportion of women who do not know their LNMP and associated factors.

Materials and Methods

Study setting: The study was conducted at the Obstetrics and Gynaecology Department of the Federal Teaching Hospital Gombe, North-eastern, Nigeria.

Study Design: This was a descriptive cross-sectional study utilizing quantitative method.

Study population: These was all ANC attendees at the booking clinic.

Inclusion criteria: They were pregnant women attending the ANC at FTHG. They gave consent to participate in the study

Exclusion criteria: Women who conceived through ART and refused consent were excluded from the study.

Sample size estimation: This was determined using the Fisher's formula of proportion studies in which it is assumed that z (level of significance, 5%=1.96); P (the proportion of women with uncertain dates in a literature: P= 67%; q=1-p; d (marginal error, 5%=0.05).

Then, the sample size based on the above assumptions was: $N = pqz2/d2$

$N = 0.67 \times 0.33 \times (1.96)2/ (0.05)2 = 339$. This was approximated to 350.

Sampling technique: This was a simple convenient non-probability sampling technique. Every consecutive ANC attendee at booking clinic was recruited.

Data collection tool: A pretested, semi-structured questionnaire was used. It was developed after intensive literature review. It was written initially in English and converted to the local dialect and then English again. The questionnaire was divided into 2 major parts. Part (A) was focused on bio data, (B) was focused on gestational age estimation.

Data collection procedure: The data was collected by the researcher and 2 well trained research assistants. There was pretesting with 10% of the women in ANC booking clinic (who did not take part in the study) for comprehensibility of the tool and it was redesign before finally administering the questionnaires on respondents. Consent was sought from the women and they were assured of confidentiality and care; even if they chose to opt out, their welfare and rights was to be safeguarded.

Dependent and independent variables: Dependent variable was gestational age estimation, while independent variables were maternal characteristics and bio-social variables.

Data processing and analysis: The data was entered into IBM® SPSS® statistical Inc., Armonk, New York, USA software version 25 for analysis. Qui-square was used as a test of statistics and the results presented in charts, graphs and tables.

Ethical Clearance: The research and ethics committee of the Federal Teaching Hospital Gombe gave a written approval for the conduct of the research.

Results

Three hundred and fifty (350) respondents participated in the study. The modal age bracket was 20-29(36.9%). Multiparous women were 247(70.6%) and grand-multiparous 103(29.4%). The majority, 304(86.9%) were married and had tertiary education 184(52.6%). The two predominant ethnic groups were Fulani 114(32.6%) and Hausa 94(26.9%). Majority 237(67.7%) were resident in urban areas, 98(28.0%) were sub-urban and 15(4.3%) rural. Those who were unemployed were 113 (32.3%), students 70(20%), civil servants 64(18.3%) among others. Those of the Islamic faith were in the majority 250(71.4%), Christianity 93(26.3%) and traditional worshipers 8(2.3%) as shown in **Table 1**.

Variable	Frequency (N)	Percentage (%)
Age group		
≤19	8	2.3
20-29	129	36.9
30-39	119	34.0
≥40	94	26.8
Parity		
1-4	247.0	70.6
>4	103.0	29.4
Marital status		
Married	304.0	86.9
Single	40.0	11.4
Separated	4.0	1.1
Widowed	2.0	0.6
Educational level		
None	11.0	3.1
Primary	30.0	8.6
Secondary	125.0	35.7
Tertiary	184.0	52.6
Ethnicity		
Hausa	94.0	26.9
Fulani	44.0	12.6
Tangale	27.0	7.7
Waja	14.0	4.0
Igbo	11.0	3.1
Tera	9.0	2.6
Yoruba	9.0	2.6
Bolewa	6.0	1.7
Others	66.0	18.9
Place of residence		
Urban	237.0	67.7
Sub-Urban	98.0	28.0
Rural	15.0	4.3
Occupation		
Unemployed	113.0	32.3
Students	70.0	20.0
Business	37.0	10.6
Others	35.0	10.0
Petty trading	20.0	5.7

| Farming	11.0	3.1
Others	35.0	10.0
Religion		
Islam	250.0	71.4
Christianity	92.0	2.8
Traditional	8.0	2.3

Table 1: Socio-demographic features of respondents

Out of the 350 respondents 181(51.7%) knew their LNMP while 169(48.3%) did not know. Among those who knew, only 34.6% were very sure of their claim. However as much as 70.6% of the respondents knew that LNMP is used to date pregnancy. Reasons for not knowing dates included; not just keeping records of dates (25.4%), ignorance of Gregorian calendar (13.0%), on contraceptives when pregnancy was identified (10.7%), no reason (8.3%), was breastfeeding (6.5%), among several others **(Figure 1)**. Most of the respondents had used various means of dating pregnancy in the past including; LNMP (26.9%), menstrual calendar (18.9%), ultrasound (18.3%), while those who did not estimate at all were 13.1% **(Figure 2)**. As much as 60% of those who did not estimate the age of their pregnancies; 38.2% gave

no reason, 16.4 % said it was the work of the doctor, 14.5 % attributed it to forgetfulness, others (16.4%) **(Figure 3)**. Surprisingly, 32% did not know the problems that may arise due to ignorance of LNMP, 20.6% said mismanagement of the pregnancy, 14.9% said no problems could arise, 13.1% said early delivery among others **(Figure 4)**. Interestingly, 92.9% of the respondents had a phone. Although, only 19.1% had a pregnancy App on their phones. Majority (90.0%) of the respondents are willing to remember their LNMP in the next pregnancy **(Figure 5)**. Women ≤ 19years and ≥ 40 years (p=0.04), lower level of education (p=0.04), Grand-multiparous (p=0.035), more than 4 living children (p=0.02) and rural dwellers (0.001) were more likely not to know their LNMP **(Table 2)**.
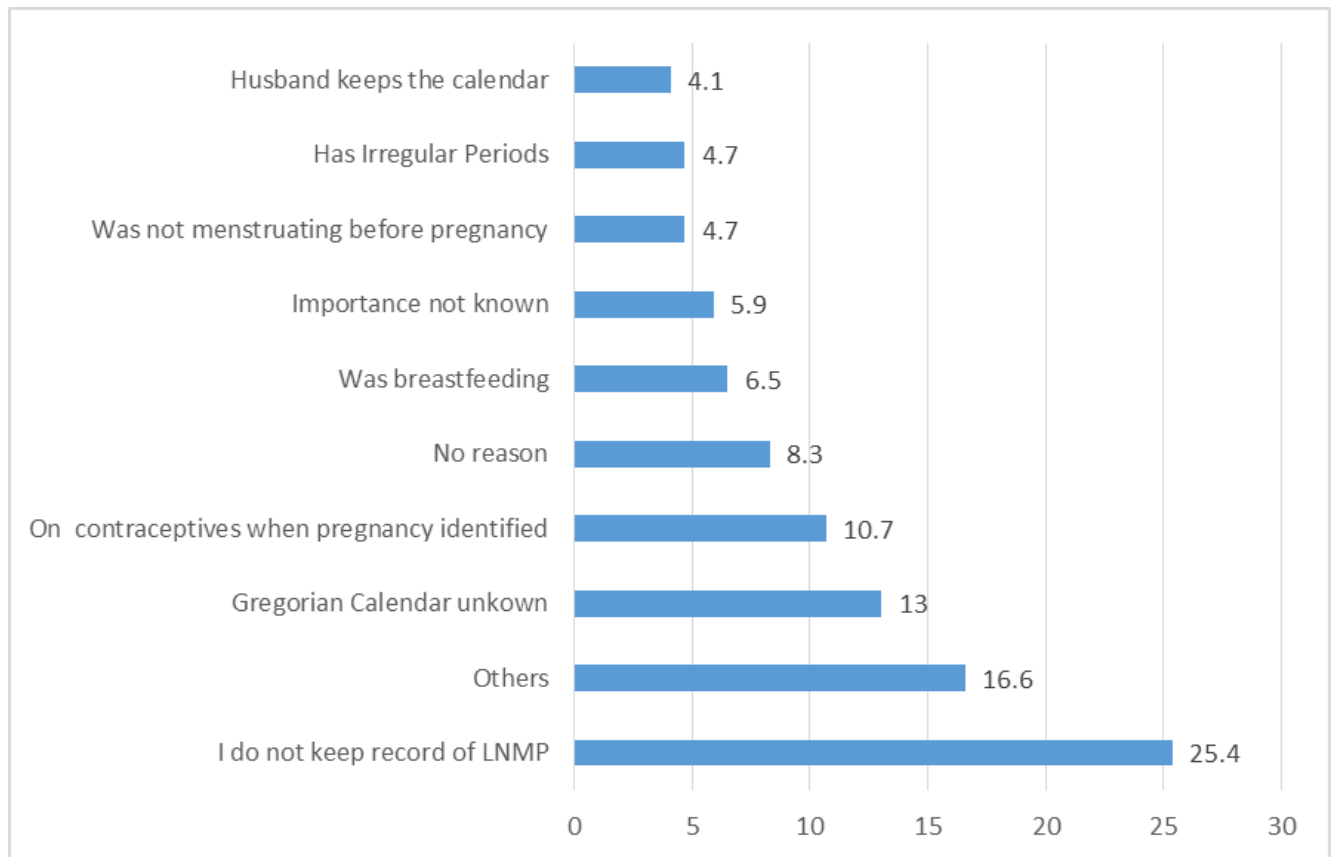
Note: Others-unplanned pregnancies, miscarriage, Illiteracy, forgetfulness, wrong calculation

Figure 1: Bar Chart showing the Percentages of the reasons why women don't know their Last Menstrual Period
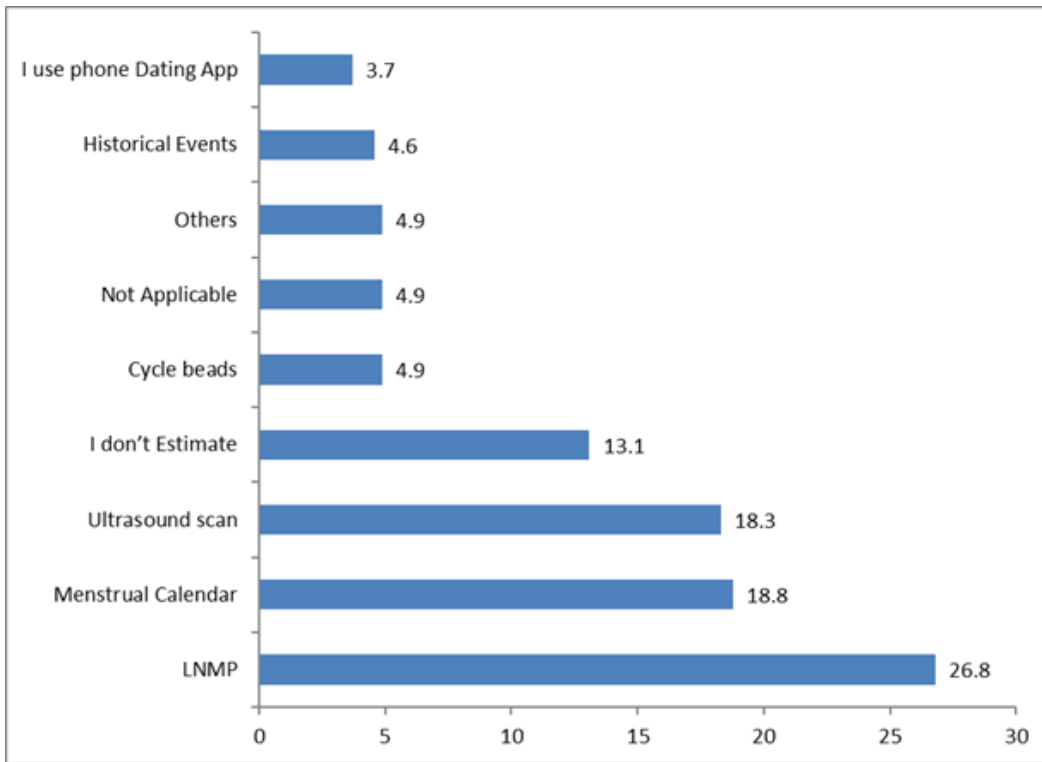
Notes: Not applicable-primigravidae, **others**: Husband's recall, Doctor's estimation, Islamic calendar

Figure 2: Bar Chart showing the various methods the women had used to estimate their pregnancies previously
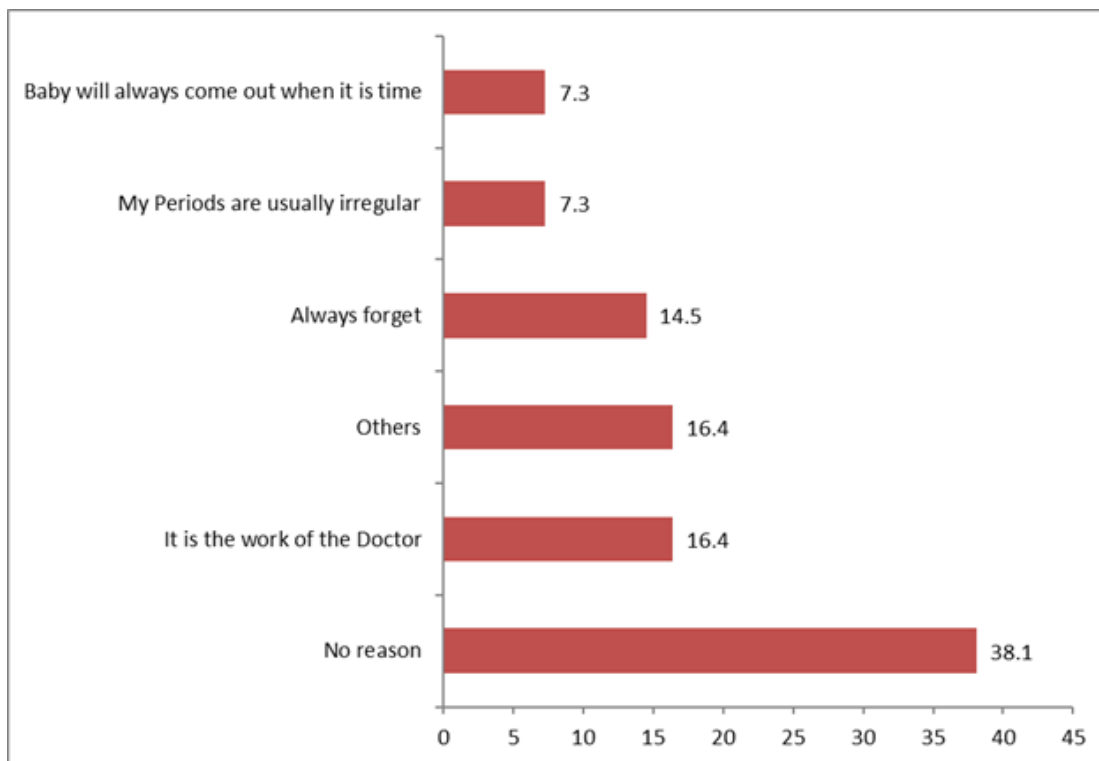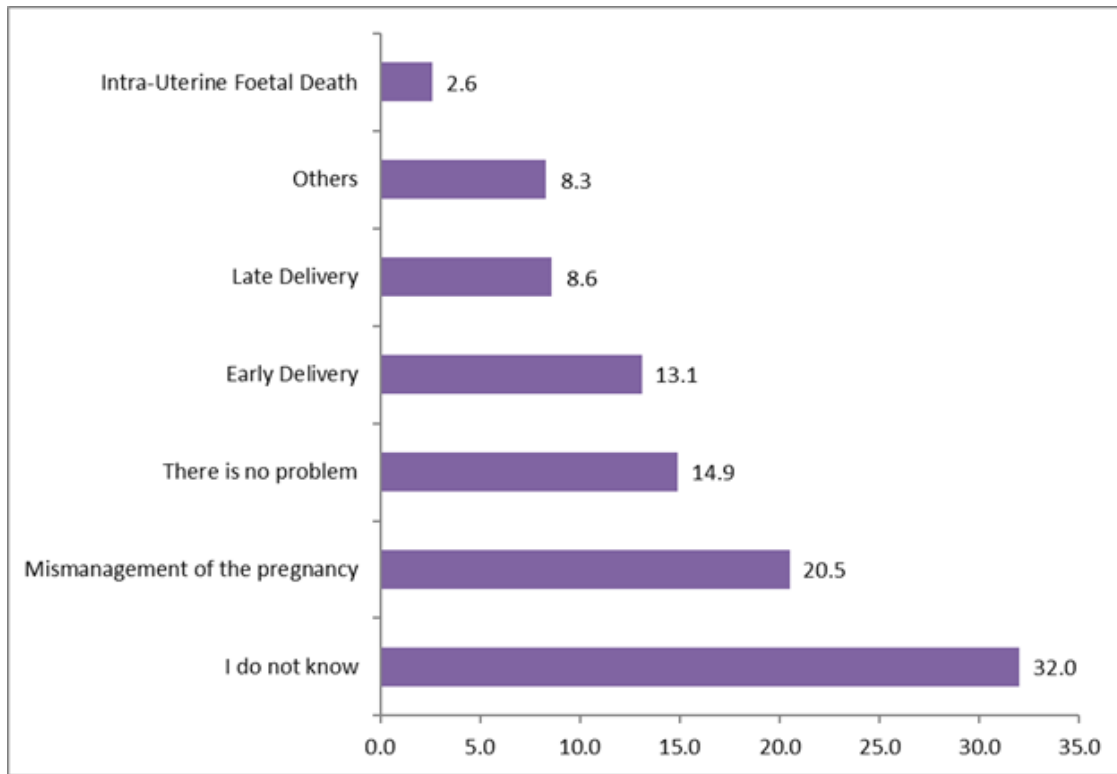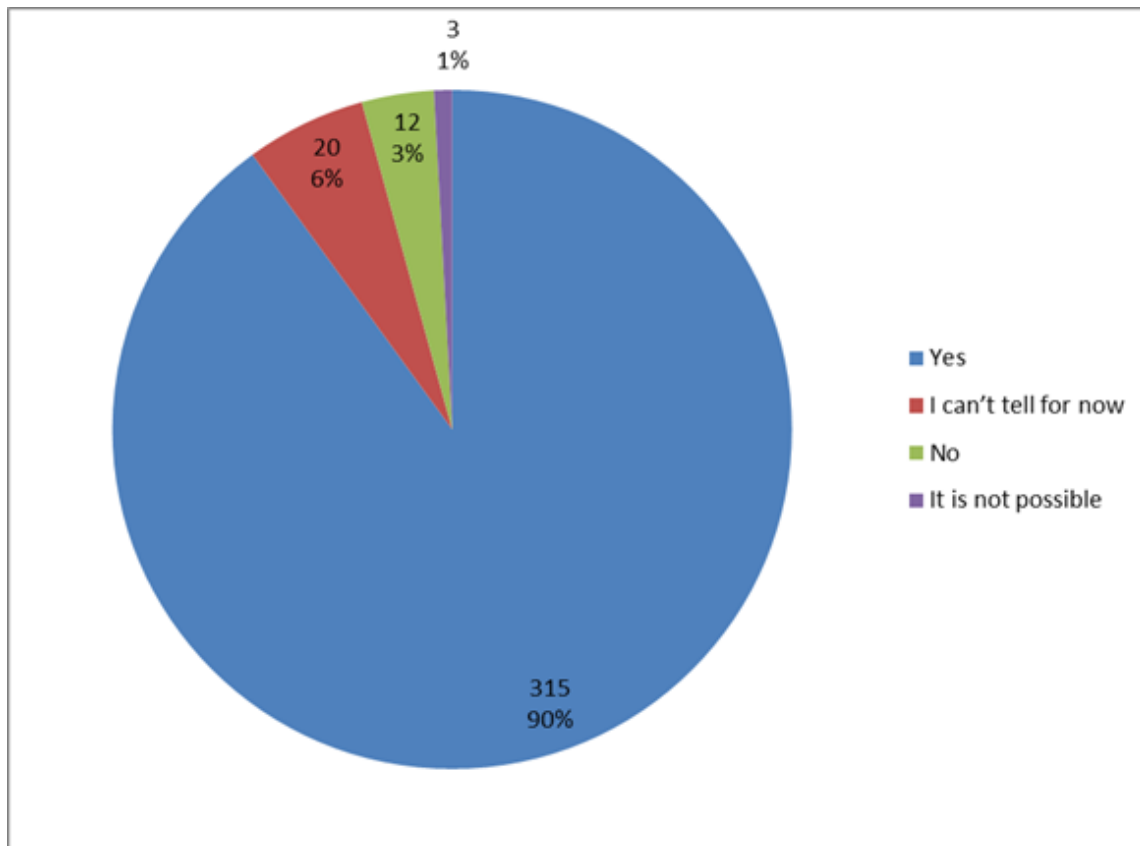

Figure 3: Bar Chart showing the Percentages of the reasons why women don't estimate the age of Their Pregnancies

Figure 4: Bar Chart showing the Percentages of the perception of the problems of unsure LNMP

Figure 5: Pie Chart showing the Percentages of women that will remember their LNMP in the next Pregnancy

Socio-demographic Features	Knowledge of LNMP		Total	Statistics
	Yes	No		
Age				χ^2=8.41 P= 0.04
≤19	3	5	8	
20-29	55	74	129	
30-39	71	48	119	
≥40	52	42	94	
Education				χ^2=8.36 P=0.04
None	4	7	11	
Primary	11	19	30	
Secondary	59	66	125	
Tertiary	108	76	184	
Parity				χ^2=5.88 P=0.05
0	70	46	116	
1-4	41	39	80	
>4	70	84	154	
No of living children				χ^2=5.25 P=0.02
≤4	138	109	247	
>4	43	60	103	
Place of residence				χ^2=11.53 P=0.001
Urban	140	98	238	
Sub-Urban	37	61	98	
Rural	5	9	14	

Table 2: Factors associated with knowledge of LNMP

Discussion

The study found that 51.7% of the women knew their LNMP and as much as 48.3% of the women at booking clinic did not know their last normal menstrual period. The number of those who did not know is too large to be ignored. Amongst the women who claimed to know their LNMP, only one-third were very sure. It implies that their claim of knowledge may be questionable. However, Wengieka and Baird also found out in their study in US that 56.0% of the women were able to accurately recall their LNMP [12]. This is comparable with the 51.7% found in this study. The uncertainty of dates has a negative impact clinically. It affects critical decision making at various stages of management of the pregnancies [3, 4].

Studies have reported the uncertainty of LNMP in dating pregnancy due to recall bias, variations in ovulation and irregularity of menses [6]. The respondents in this study advanced reasons such as; not keeping dates, forgetfulness, ignorance of Gregorian calendar, contraceptive use, breastfeeding, irregularity of periods, and ignorance of the benefit among others. However, some of the methods used in the past that were mentioned by the respondents included, menstrual calendar, cycle beads, historical events, phone dating apps, ultrasound etc.

Among all the methods used in the past by the respondents as observed in the study, it is important to mention here that the use of ultrasonography is highly encouraged because when performed with accuracy and precision, studies have shown that first trimester prenatal ultrasound is the best method for gestational age dating [13-16]. Moreover, when compared with USS, LNMP overestimated pregnancies with an insignificant margin of 0.2 and 0.5 days as observed in two different studies in South Africa [13]. Similar studies reported an overestimate of 1.5 in Vietnam, and 0.8 days in US [13-14].

Although, the observable over-estimation of dates using LNMP means that in clinical practice, some pregnancies may most often be considered post-term when they are not. This ordinarily should constitute a problem of mis-management but for the non-statistical measure of the variation when compared to the use of USS for dating [13-16]. It is important to emphasize here again that, as prenatal ultrasonography requires expensive equipment and skilled medical professionals to operate the machine, the imperative of using the LNMP to estimate the gestational age in the women in low resource setting is real [13].

It was interesting to note that the Hausa/Fulani ethnicity were more likely not to know their LNMP. Some of these clients do not know Gregorian calendar but understood Islamic calendar and other methods so well. It is therefore instructive not to insist on the Gregorian calendar but Islamic calendar, historical events and other traditional methods could be emphasized to these cohort of clients as a means of helping them recall their dates with near accuracy. The Gregorian equivalent of these dates can easily be obtained using apps that can convert Islamic days to the Gregorian dates. There are so many of these app available on the internet.

Although, there are several benefits for accurate dating of pregnancy such as; reduction in the need for post term induction, preterm births, prediction of fetal growth [5, 8] etc., one-third of the respondents did not know the consequences of unsure dates while others did not see any problems at all. This is worrisome and must be corrected through adequate and effective information dissemination. The health education, promotion and preventive measures at the antenatal clinics should target the aspect of early and accurate dating of pregnancy and the consequence of not doing so with the clients. These awareness programs should also be extended to primary health centers (PHC), secondary health facilities and the community/rural clinics in form of an outreach in order to reach a wider population.

In a technologically driven society such as ours, the use of electronic devices such as pregnancy dating apps on phones could be employed to help the women date their pregnancies. Although majority of the women were found to have phones but a small fraction of them use pregnancy dating apps. Clinicians could be magnanimous enough to provide and enlighten the women on the use of these apps. This is doable and should be encouraged. It was interesting to find that a very large proportion of the respondents knew that LNMP is used to date pregnancy. This makes the acceptability of the practice of LNMP recall easier when they are properly educated. No wonder majority of them accepted to begin to attempt at keeping LNMP going forward.

The study found that the knowledge of LNMP was significantly related to age, education, and parity, number of living children and place of residence. The age group within 20 to 40 years were more knowledgeable than the extreme of ages. Studies have shown that adolescence do not have a proper knowledge of their menstrual periods [17]. The older women could be relying on their experience and as such care less about recall of LNMP. This makes the need to sustain campaign against child pregnancies and conception at advanced biological ages. These groups of women contribute more significantly to maternal morbidity and mortalities [18].

More of the educated women knew their dates when compared with less educated women. Other studies have also reported that the accuracy of recall of LNMP is impeded by low literacy rates and cultural factors and hence their knowledge could be improved with literacy and training of health workers [19, 20]. Educating and empowering women will also contribute to safer lower parities amongst them [21, 22]. Girl child education is key to preventing reproductive health related morbidities.

Furthermore, the need to limit family size should be given consideration with the finding that grand multiparous women with more than four children were less likely to know their LNMP when compared with women of lower parity and with four or less number of children. As mentioned earlier, grand multiparous women rely on experience and are more likely to care less about basic maternity indices that would ensure safe motherhood. Although some studies currently do not find the grand multipara as a higher risk woman compared to lower parities. The risk of morbidity and mortality is said to be comparable with low parity women [21]. And thus, the opinion is that classifying grand multiparous women as a high-risk group without a very clear evidence of a consistent correlation with adverse obstetric outcome can lead to socioeconomic burdens to the mother, family and health systems [21-23].

Women who were urban dwellers knew their LNMPs more than rural dwellers. Therefore, rapid urbanization that brings health, enlightenment, education etc. closer to the people should be the target of political leaders that govern particularly in low resource nations.

Conclusion

The study showed that 48.3% of the women were ignorant of their LNMP. The associated factors were extreme of ages, low level of education, higher parity, more than 4 living children and rural place of residence. Going forward, majority of the women accepted to remember their LNMP.

Recommendations

1. Girl child education should be sustained. Health awareness, promotion, and preventive activities so as to educate the women of reproductive age at community and also at the ANC clinics should be done.

2. Efforts should be made to Promote family size limitation.

3. Preconception care could also help since some pregnancies are unplanned.

4. Efforts towards rapid urbanization and infrastructural development to bring health closer to the people in the communities is expected from political leaders in developing nations and low resource communities.

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