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Marriage-Age and Fertility Pattern among Reproductive Age Women in Abakaliki, Ebonyi State, South East Nigeria

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Abstract

Introduction: In Nigeria, one of the major reasons for marriage is procreation and married couples look forward to having children within a year or two of marriage. The age of marriage is on the increase in this part of the world. Many women are now increasingly getting engulfed in career and academic pursuits at the detriment of early marriage. Many men are also not interested in marrying women who have no job. There is age-related acceleration of primordial follicle depletion which is of great clinical importance because it is associated with a significant decrease in fecundity. **Objective:** This study assessed the ages of the marriage of women who attended Fertility and Antenatal clinics at the National Obstetric Fistula Centre and Smile Specialist Hospital, Abakaliki, and their relationship with the fertility pattern of these women. **Methods:** This was a cross-sectional study of 352 consenting married women who sought and received fertility and Antenatal care at the National Obstetric Fistula Centre and Smile Specialist Hospital Abakaliki, South-East Nigeria between February 1, 2022 and January 31, 2024. Semi-structured questionnaires were administered to the participants over a two-year period. Data was analyzed using IBM SPSS version 20. A test of statistical significance was done using Chi Square. **Results:** The age group with the highest education was 26 - 30. This was statistically significant ($X^2 = 90.893$, P-value < 0.005). 40.6% of the participants were pregnant at the time of the study. The majority of the participants married in the age group 26 - 30 (41.5%). The age of marriage with the least infertility was 21 - 25 (32.9%). After age 25, infertility was noted to have increased with increasing age at marriage. The majority of the participants (31%) waited for 1 - 2 years before conception. This was statistically significant ($X^2 = 294.555$, P-value <

0.005). A greater percentage of the participants agreed they married late (31%). This was statistically significant (X^2 = 173.007, p-value < 0.005). The majority of the participants regretted the age at which they got married (34.9%), with more regrets at higher ages of marriage. This was statistically significant (X^2 = 129.494, P-value < 0.005). 81% of the participants agreed that the best age for marriage should be before age 25. This was statistically significant (X^2 = 169.300, p-value < 0.005). The major reasons for delayed marriage were educational pursuits (76.1%), followed by a deliberate refusal to marry till jobs were secured. This was statistically significant (X^2 = 279.230, p-value < 0.005). **Conclusion:** There is increased difficulty at conception at marriage age above 25 years. The major reasons for delayed marriage were academic pursuit and lack of gainful employment. Education of the masses and inclusion of biological dynamics of the female reproductive behaviours as part of the core school curriculum will help enlighten the female and the male folks alike to enable them to make informed decisions with regard to the timing of marriage and commencement of procreation. This will help reduce infertility and save millions of couples the agony associated with infertility.

Keywords

Fertility, Reproductive Age Women, Marriage-Age, Conception-Age

1. Introduction

One of the major reasons for marriage is procreation and many married couples especially in the African setting look forward to having children within a year or two of marriage [1].

Infertility is the inability of a couple to achieve conception after 12 months of regular unprotected coitus of about 2 - 3 times a week. It may be primary, when the woman has never achieved conception or secondary, if the woman has ever conceived, irrespective of the outcome of the pregnancy. Factors that could cause infertility could be male or female or both [2]. The incidence of infertility is on the rise globally [2]. The rise in the incidence of infertility is attributed to many factors including the rising age at marriage, increasing age of commencement of childbearing, and increasing tubal and male factor infertility [2]-[5].

In sub-Saharan Africa, childbearing is the main reason for marriage, hence, the absence of pregnancy and children after marriage can pose serious psychological, emotional, financial and family stress which may lead to divorce [5] [6].

It has been observed over the years that the age of marriage is on the increase in this part of the world. Many women are now increasingly getting engulfed in career and academic pursuits at the detriment of early marriage [7]. Many men are also not interested in marrying women who have no job. They want "already made" women. All these together are responsible for the increasing age of marriage [4]. Other factors that have been implicated as responsible for delayed

marriage include parental interference/lack of parental consent, quest for gainful employment before marriage, absence of suitors, and cultural and religious reasons 1 - 3.

Women over 35 years of age have an increased risk of infertility, pregnancy problems, spontaneous abortion, congenital malformations, and postnatal issues [8] [9].

The primordial follicles comprise a pool of non-growing follicles from which all pre-ovulatory follicles are ultimately derived. A primordial follicle consists of a small (≈15 μm in diameter) oocyte arrested in the dictyotene stage of meiosis, a single layer of squamous granulosa cells, and a thin basal lamina that encloses both cell types. No blood vascular system is directly associated with the primordial follicles [10].

In humans, the primordial follicles are formed in the fetal ovaries between the sixth and ninth months of gestation. At this time, it is believed that all viable female germ cells have committed to meiosis. As a result, by the end of gestation there is no further production of new oocytes [10].

Between 6 and 9 months of gestation, as primordial follicles are forming, a profound loss of oocytes occurs through apoptosis. Throughout the first 30 years of a woman's life, primordial follicles are serially activated at a steady rate and recruited to progress through the stages of folliculogenesis toward their destiny of either atresia or ovulation [10] [11]. Beyond this time, the rate of loss of follicles to atresia accelerates. This physiological process contributes to a loss of ovarian reserve that has been linked to declining fecundity over the age of 35 years [10] [12].

Consequently, it is most likely that all the oocytes in a woman's ovaries are present at birth. Once the primordial follicles are formed, some are recruited to grow. As a woman ages, the process of recruitment continues on a regular basis until the total primordial follicle compartment is exhausted [10] [13].

An important concept is that the loss of primordial follicles or ovary reserve (OR) is not constant during aging. For example, a significant accelerated decrease in OR occurs at about 37 years of age in most women [14].

Clinically, this age-related acceleration of primordial follicle depletion is of great importance because it is associated with a significant decrease in fecundity [10] [15].

Studies in Ethiopia show a decline in fertility [16] [17]. This decline is attributable to increased age at first marriage, a decreased proportion of currently married women, a shift in women's birth to later age, and a higher women's educational status [8].

Though Africa continues to have the highest fertility rate in the world, with the fertility rates in Sub-Saharan Africa significantly higher than other sections of the continent, this has however, continued to decline from 6.7 children per woman in 1970 to 5.1 in 2015. This decline has persisted to the extent that in recent years, sub-Saharan Africa has become the region with the most rapid pace of fertility

decline [17].

The vast majority of women in India (97%) are married by age 30, and their average age at first birth is only 21.3 years old. In spite of these patterns, average fertility has declined in India as a result of earlier termination of childbearing [18].

In the United States, postponing marriage beyond age 30 is associated with lower fertility [8].

It has been shown that providing information to the general public and university students on the relationship between age and fertility resulted in significant reductions in the ideal age of marriage and age at first childbirth, and significant increases in the expected probability of marriage before age 30 [18].

Alan Guttmacher Institute (1995) has noted that marriage at later ages allows women to prolong their education and delay first births, such that women tend to have less fertility [19].

It has been shown that fertility declines with increasing age at marriage (Adlakha *et al.* 1991). Marriage patterns have been shown to be the most important factor in reducing fertility (Adlakha, Ayad and Kumar, 1991). In Pakistan, the age at which women became married for the first time contributed about 38.7% of the fertility decline between 1984 and 1988 [17] [20].

No study has been done in this part of the world that critically evaluated the age of marriage and the relationship between the age of marriage and infertility; hence, there is a need for this study.

2. Objective

The objective of this study is to assess the relationship between ages at marriage and the reproductive pattern of women who attended fertility and antenatal clinics at the National Obstetric Fistula Centre and Smile Specialist Hospital in Abakaliki.

3. Methods

Setting: This study was conducted at two health institutions, one tertiary health institution (National Obstetric Fistula Centre) and another, a private Fertility Specialist Hospital, (Smile Specialist Hospital) both located in Abakaliki, South-East Nigeria. Both are involved in fertility and maternity services. While National Obstetric Fistula Centre Abakaliki came into existence in 2011, Smile Specialist Hospital Abakaliki was established in 2012. Both hospitals were selected for the study because they were the only hospitals in Ebonyi State that offered both conventional and Assisted Reproductive Technology including Invitro Fertilization and Embryo Transfer, at the time of this study.

Participants: This was a cross-sectional study of 352 consenting married women conducted over a two-year period (February 1, 2022 to January 31, 2024). Among the 352 participants, 143 were recruited from Antenatal Clinics and 209 from Fertility Clinics. 200 were from Smile Specialist Hospital (144 from Fertility Clinic and 56 from Antenatal clinic) while 152 were from National Obstetric

Fistula Centre (65 from Fertility Clinic and 87 from Antenatal Clinic). Out of the 352 participants, 183 suffered primary infertility while 169 had secondary infertility. Women aged 16 years and above were included while single women, non-pregnant women with tubal or male factor infertility, women who married but deliberately embarked on voluntary desire not to conceive for some years before they decided to conceive and women who refused to consent were excluded from the study. Every woman who presented for fertility treatment and randomly selected pregnant women who presented for antenatal care at the hospitals was a candidate for the study after ruling out the exclusion criteria as mentioned above. Women who met the inclusion criteria were further asked to voluntarily consent to the study or opt-out. Those who consented were finally included but were told they could still opt-out at any stage of the study.

Instruments

Semi-structured questionnaire. This semi-structured questionnaire designed by the authors has two parts: Part A: shows the socio-demographic characteristics of the study participants. The socio-demographic component of the questionnaire provided information about age, level of education and ethnicity/tribe.

Part B: This shows the fertility pattern of the participants. The Fertility pattern part of the questionnaire elicited information about the age at marriage, the participant's perception of the proper age of marriage, whether she thinks she married late or early, whether or not she regrets her age at marriage, information on whether the participant ever got pregnant or not and the waiting time (in years) before conception.

The semi-structured questionnaire was distributed randomly to two groups of consenting women: group one comprised of women attending fertility clinics at the National Obstetric Fistula Centre (NOFIC) and Smile Specialist Hospital, both in Abakaliki, the capital of Ebonyi State, South East Nigeria. The second group was comprised of pregnant women attending the Antenatal Clinic (ANC) at the two hospitals. Trained Research Assistants, who understood the three major Nigerian languages of Igbo, Yoruba and Hausa and English language, were used to distribute the questionnaires and extract the needed information including information on the age, level of education and ethnicity/tribe and information about the age at marriage, participants perception of proper age of marriage, whether she thinks she married late or early, whether or not she regrets her age at marriage, information on whether participant ever got pregnant or not and the waiting time (in years) before conception.

Procedure: The women who met inclusion criteria were recruited for the study as they presented at the hospitals after diligent counseling. Those who consented were given a semi-structured questionnaire to go home with, answer the questions and return the questionnaire during the subsequent clinic visit.

Statistical analysis: Information obtained was analyzed using IBM SPSS version 20. The chi square, standard deviation and statistical significance were calculated.

Data were displayed using tables and percentages.

Ethical issues: The study protocol was approved by the Ethics and Research Committee of the National Obstetric Fistula Centre Abakaliki. The study procedure was interview-based and non-invasive. Written informed consent was also obtained from all the willing participants. Participants were duly informed that they could freely withdraw from the study protocol at any point, even after having consented. Such withdrawals did not affect their medical care in the hospitals.

4. Results

Table 1 shows that among the three hundred and fifty-two women that were analyzed, 200 (56.8%) were graduates, 114 (32.4%) had secondary education as their highest level of education, and 33 (9.4%) were postgraduates while only 5 (1.4%) had only primary education.

The age group with the highest level of education was 26 – 30 years. 52 (17.6%) of this age group were graduates and 11 (3.1%) were postgraduates. 55 (15.6%) of those between the age group 31 - 35 years were graduates and 6 (1.7%) were postgraduates. The difference was statistically significant, P value < 0.005.

The Igbo tribe formed 331 (94.0%) of the total participants, 20 (5.7%) were of Yoruba tribe while 1(0.3%) were of Ijaw extraction. The difference was statistically significant with a P-Value of < 0.005.

Among the 352 women who participated in this study, 208 (59.1%) were nulliparous, 69 (19.6) were primipara while 70(19.9) were multipara and 5 (1.4) were grandmultipara. Among those aged 16 - 20 years, 2 (0.6) were nulliparous, 20 - 25 years, 40 (11.4) were nulliparous, 26 - 30 years of age, 52 (14.8) were nulliparous, 31 - 35 years, 46 (13.1) were nulliparous, 36 - 40years, 53 (15.1) were nulliparous, among those 41 - 45 years, none were nulliparous while 15 (88.3) out of the 17 people aged > 45 years at the time of the study, were nulliparous and the difference was statistically significant with P-value < 0.005.

Table 1. Socio-demographic characteristics of the participants.

Variables	**Educational Status**					
	N = 352					
Age in years	Primary	Secondary	graduate	postgraduate	Test statistics	P-Value
	n(%)	n(%)	n(%)	n(%)		
16 - 20	0 (0.0)	2 (0.6)	0 (0.0)	0 (0.0)		
21 - 25	1 (0.3)	21 (6.0)	38 (10.8)	5 (1.4)		
26 - 30	1 (0.3)	16 (4.5)	52 (17.6)	11 (3.1)		
31 - 35	0 (0.0)	23 (6.5)	55 (15.6)	6 (1.7)		
36 - 40	3 (0.9)	49 (13.9)	11 (3.1)	11 (3.1)		
41 - 45	0 (0.0)	1 (0.3)	19 (5.4)	0 (0.0)		
>45	0 (0.0)	2 (6.0)	15 (4.3)	0 (0.0)	$X^2 = 90.893$	<0.005

Continued

TRIBE								
	IGBO	YORUBA	IJAW					
16 - 20	2 (0.6)	0 (0.0)	0 (0.0)					
21 - 25	48 (13.6)	17 (4.8)	0 (0.0)					
26 - 30	90 (25.6)	0 (0.0)	0 (0.0)					$X^2 = 54.295$
31 - 35	83 (23.6)	1 (0.3)	0 (0.0)					P-value < 0.005
36 - 40	72 (20.5)	2 (0.6)	0 (0.0)					
41 - 45	20 (5.7)	0 (0.0)	0 (0.0)					
>45	16 (4.5)	0 (0.0)	1 (0.3)					
TOTAL	331 (94.0)	20 (5.7)	1 (0.3)					
PARITY								
	P0	P1	P2	P3	P4	P5	>P5	
16 - 20	2 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
21 - 25	40 (11.4)	20 (5.7)	2 (0.6)	3 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)	
26 - 30	52 (14.8)	15 (4.3)	13 (3.7)	5 (1.4)	1 (0.3)	3 (0.9)	1 (0.3)	
31 - 35	46 (13.1)	21 (6.0)	6 (1.7)	7 (2.0)	3 (0.9)	1 (0.3)	0 (0.0)	$X^2 = 154.069$
36 - 40	53 (15.1)	5 (1.4)	4 (1.1)	2 (0.6)	10 (2.8)	0 (0.0)	0 (0.0)	P-value < 0.005
41 - 45	0 (0.0)	6 (1.7)	1 (0.3)	13 (3.7)	0 (0.0)	0 (0.0)	0 (0.0)	
>45	15 (4.3)	2 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Total	208 (59.1)	69 (19.6)	26 (7.4)	30 (8.5)	14 (4.0)	4 (1.1)	1 (0.3)	

Table 2 indicates that among the 352 who participated in the study, 45 (12.8%) people married at the age range of 16 - 20 years, 94 (26.7%) married at the age 21 - 25 years, 146 (41.5%) married at the age of 26 - 30years, 49 (13.9%) married at the age range 31 - 35 years, 16 (4.5%) married at the age range 36 - 40 years while 1 (0.3%) married at the age range 40 - 45 years and > 45 years respectively. The difference was statistically significant with a P-value of < 0.005.

Table 2. Age at which the participants got married.

	Frequency	**Percentage (%)**
Age at marriage(yrs)		
16 - 20	45	12.7
21 - 25	94	26.7
26 - 30	146	41.5
31 - 35	49	13.9
36 - 40	16	4.6
41 - 45	1	0.3
>45	1	0.3
Total	**352**	**100.00**

$X^2 = 829.059$, $P < 0.005$.

Among the participants who married at the age of 16 - 20 years, 23(51.1%) were yet to conceive, 31 (32.9%) of those who got married at the age of 20 - 25 years were yet to conceive while 80 (54.8%) of those who got married at age 26 - 30 years were yet to conceive. Among the participants who got married at age 31 - 35 years, 33 (67.3%) were yet to get pregnant, and among the 16 participants who got married at age 36 - 40 years, 14 (87.5%) were yet to get pregnant while all the participants who got married at age > 40 years, were yet to get pregnant and the difference was statistically significant with a P-value of < 0.005 (Table 3).

Table 3. Relationship of age at marriage and conception.

Age at marriage	Yet to get pregnant			
(YEARS)	YES	NO	Total	
16 - 20	23 (51.1%)	22 (48.9%)	45	
21 - 25	31 (32.9%)	63 (67.1%)	94	
26 - 30	80 (54.8%)	66 (45.2%)	146	
31 - 35	33 (67.3%)	16 (32.7%)	49	
36 - 40	14 (87.5%)	2 (12.5%)	16	
41 - 45	1 (100.0%)	0 (0.0)	1	$X^2 = 28.979$
>45	1 (100.0%)	0 (0.0)	1	P-value < 0.005
TOTAL	183 (52.0%)	169 (48.0%)	352	

Among the participants, 109 (31.0%) agreed they married late. Among those who married at age 16 - 20, 1 (2.2%) said they married late. Also, 1 (1.1%) of those who got married between 21 - 25 years of age said they married late. 49 (33.6%) of those who got married at age 26 - 30 years agreed they married late while 40 (81.6%) of those who married at age 31 - 35 years agreed they married late. Of those who married at age 36 - 40 years, 16 (100.0%) agreed they married late. All those who married at age 41 - 45 years and those who married at age > 45 years all agreed they married late. Fischer's exact test was 173.007 and the difference was statistically significant with a P-value of < 0.005 (Table 4).

Table 4. Participants' perception of whether they married late or not.

Age of marriage	Perception of late marriage			
(years)	Yes	No	Total	
16 - 20	1 (2.2%)	44 (97.8%)	45	
21 - 25	1 (1.1%)	93 (98.9%)	94	
26 - 30	49 (33.6%)	97 (66.4%)	146	$X^2 = 173.007$
31 - 35	40 (81.6%)	9 (18.4%)	49	
36 - 40	16 (100.0%)	0 (0.0)	16	
41 - 45	1 (100.0%)	0 (0.0)	1	
>45	1 (100.0%)	0 (0.0)	1	
Total	109 (31.0%)	243 (69.0%)	352	P-Value < 0.005

Among the analysed, 138 (39.2%) agreed that the best age for marriage is 25 years, while 117 (33.2%) said it was 24 years that is the best age to get married. 30 (8.5%0) said it was 20 years of age while 20 (5.2%) said the best age of marriage was 28 years and the difference was statistically significant with a P-value of < 0.005 (Table 5).

Table 5. The perceived best age for marriage.

Age of marriage	Best age to get married (years)												
(years)	18	19	20	21	22	23	24	25	26	27	28	30	34
16 - 20	1 (0.3)	2 (0.6)	14 (4.0)	0 (0.0)	3 (0.9)	0 (0.0)	15 (4.3)	9 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0)	0 (0.0)
21 - 25	1 (0.3)	13 (3.7)	190.3)	0 (0.0)	4 (1.1)	3 (0.9)	19 (5.4)	53 (15.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
26 - 30	0 (0.0)	0 (0.0)	13 (3.7)	1 (0.3)	5 (1.4)	1 (0.3)	51 (14.5)	51 (14.5)	3 (0.9)	2 (0.6)	18 (5.1)	1 (0.3)	0 (0.0)
31 - 35	0 (0.0)	0 (0.0)	2 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	18 (5.1)	22 (6.2)	0 (0.0)	2 (0.6)	1 (0.3)	4 (1.1)	0 (0.0)
36 - 40	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	13 (3.7)	2 (0.6)	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)
41 - 45	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
>45	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	2 (0.6)	15 (4.3)	30 (8.5)	1 (0.3)	12 (3.4)	4 (1.1)	117 (33.2)	138 (39.2)	3 (0.9)	4 (1.1)	20 (5.7)	5 (1.4)	1 (0.3)

$X^2 = 169.300$, $p \leq 0.005$.

Among those who regretted the age at which they got married, 70 (47.9%) of those who married at the age of 26 - 30 years regretted getting married at that age, 31 (63.3%) of those who married at age 31 - 35 years regretted getting marrying at that age, while 14 (87.5%) regretted getting married at age 36 - 40 years and all the people who got married at age > 40 years regretted the age they got married. The difference was statistically significant with a P-value of < 0.005 (Table 6).

Table 6. Participants' regrets about their ages of marriage.

Age at marriage	Regret at the age of marriage		Total
(years)	YES	NO	
16 - 20	5 (11.1%)	40 (88.9%)	45
21 - 25	1 (1.1%)	93 (98.9%)	94
26 - 30	70 (47.9%)	76 (52.1%)	146
31 - 35	31 (63.3%)	18 (36.7%)	49
36 - 40	14 (87.5%)	2 (12.5%)	16
41 - 45	1 (100.0%)	0 (0.0)	1
>45	1 (100.0%)	0 (0.0)	1
TOTAL	123 (34.9%)	229 (65.1%)	352

$X^2 = 129.494$, P-value < 0.005.

Among the participants in this study, the waiting time before getting pregnant was as follows; 1 (0.5%) had to wait < 6 months, 43 (23.1%) had to wait for 1 - 2

years, 15 (8.1%) waited for 2 - 3 years, 14 (7.5%) waited for 3 - 4 years, 20 (10.8%) had to wait for 4 - 5 years, 17 (9.1%) and (17 (9.1%) had to wait for 5 - 6 years and 6 - 7 years respectively, 29 (15.6%) had to wait for 7 - 8 years, 14 (7.5%) had to wait for 8 - 9 years another 14 (7.5%) had to wait for 9 - 10 years while 2 (1.1%) had to wait for > 10years to get pregnant Chi square of 294.555 and P-value < 0.005 (Table 7).

Table 7. Average waiting time to get pregnant by the participants.

Age at marriage	How long she waited yet to conceive										
(YEARS)	(MONTHS/YEARS)										
	<6mths	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 9	9 - 10	>10
16 - 20	0 (0.0)	6 (3.2)	0 (0.0)	4 (2.2)	13 (7.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
21 - 25	0 (0.0)	5 (2.7)	10 (5.4)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	14 (7.5)	1 (0.5)	0 (0.0)	0 (0.0)
26 - 30	1 (0.5)	15 (8.1)	5 (2.7)	9 (4.8)	7 (3.8)	13 (7.0)	4 (2.2)	0 (0.0)	13 (7.0)	14 (7.5)	2 (1.1)
31 - 35	0 (0.0)	16 (8.6)	0 (0.0)	0 (0.0)	0 (0.0)	3 (1.6)	13 (7.0)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)
36 - 40	0 (0.0)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	13 (7.0)	0 (0.0)	0 (0.0)	0 (0.0)
41 - 45	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
>45	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)
Total	1 (0.5)	43 (23.1)	15 (8.1)	14 (7.5)	20 (10.8)	17 (9.1)	17 (9.1)	29 (15.6)	14 (7.5)	14 (7.5)	2 (1.1)
Test statistics	$X^2 = 294.555$	P < 0.005									

Among those who presented with pregnancy, 15 (33.3%) of those who married at 16 - 20 years were pregnant at the time of the study. 56 (59.6%) of those who married at 21 - 25 years were pregnant, 54 (37%) of those who married at 26 - 30 years were pregnant, 16(4.5%) of those who married at age 31 - 35 years were pregnant, 2 (0.6%) of those who married at age 36 - 40 years were pregnant while none of those who married beyond 40 years were pregnant and the difference was statistically significant with P-value 0.006 (Table 8 and Table 9).

Table 8. Participants who were pregnant at the time of the study.

Age at marriage	Currently pregnant (%)		
(years)	Yes	No	Total
16 - 20	15 (33.3%)	30 (66.7%)	45
21 - 25	56 (59.6%)	38 (40.4%)	94
26 - 30	54 (37.0%)	92 (63.0%)	146
31 - 35	16 (32.7%)	33 (67.3%)	49
36 - 40	2 (12.5%)	14 (87.5%)	16
41 - 45	0 (0.0)	1 (100.0)	1
>45	0 (0.0)	1 (100.0)	1
Total	143 (40.6%)	209 (59.4%)	352

$X^2 = 23.325$, P-value = 0.006.

Table 9. Reasons for late marriage (N = 352).

Reasons for late marriage	Number	Percentage (%)
Pursuit of Education	268	76.1
No suitor to came	20	5.7
Parents refused the suitor I liked	11	3.2
Didn't see any suitor I liked	16	4.5
Didn't want to marry till I secure job	37	10.5
Total	**352**	**100.0**

5. Discussion

A greater percentage of the participants in this study attained tertiary education with the highest number of participants in the age range of 26 - 30 years being the most educated followed by the age group of 31 - 35 years. The educational attainment of the participants in relation to their parity was found to be statistically significant (P-value 0.005). This could be explained by the fact that the two hospitals where the study was conducted were located in the State capital. Most women who reside in the State capitals (urban areas) work in the formal sector as public servants and therefore are likely to be educated. It may also reflect the increased literacy level of the girl child in this part of the country. This is in consonance with other studies that reported that the pursuit of higher education by a girl child tends to increase the age at marriage and therefore increases the age at first birth, with a consequent reduction of fertility [9] [19]. The highest number of nulliparous women was seen with the age bracket of 36 - 40 years. This agrees with some findings that fertility rises from menarche and peaks at age 25 years, thereafter begins to decline, with a 50% decline at age 35 and a 75% decline at 37 years of age [5]. An important concept is that the loss of primordial follicles or ovary reserve (OR) is not constant during aging. A significantly accelerated decrease in ovarian reserve (OR) occurs at about 37 years of age in most women [10]. Clinically, this age-related acceleration of primordial follicle depletion is of great importance because it is associated with a significant decrease in fecundity [10].

The majority of the participants were of the Igbo tribe. This is expected since Abakaliki, as an emerging town, is still dominated by indigenes of the Igbo tribe.

The majority of the participants married at the age above 25 years, with the highest number being married in the age bracket of 26 - 30 years. This is statistically significant, P-value < 0.005. The main reasons for a delay in marriage included the pursuit of education, a decision not to marry till the job is secured and the absence of suitors. This agrees with other studies which reported increasing age at marriage by women all over the world including the women of sub-Saharan Africa, for various reasons including the pursuit of education and jobs, as the main reasons for a delay in marriage [8] [18].

Out of the 352 participants in this study, the majority had not achieved

conception at the time of the study. The age bracket with the least difficulties in conception was 21 - 25 years. Infertility (delay in conception) in this study increases with increasing age from 26 years and above, with the greatest percentage of those who married at the age bracket 36 - 40 years still not pregnant. This is a statistically significant P-value < 0.005. It has been reported that female fertility increases from puberty, peaks at age 25 and begins to decline; by age 35, the female fertility has dropped to 50% and at age 37, it has dropped by 75%. Women are more likely to have difficulties in conception after 35 years of age and when they conceive, spontaneous miscarriage and congenital anomalies are more likely to occur [5] [7]-[9].

A greater number of the participants who got pregnant waited for only 1 - 2 years before conception. This is statistically significant, P-value < 0.005. This agrees with WHO recommendation on the modified definition of infertility for practical and clinical purposes. Though infertility has been defined conventionally as the inability of a couple to achieve conception after 12 months of regular, unprotected sexual intercourse of about 2 to 3 times a week, the World Health Organization, has however recommended a definition based on 24 months of trying to conceive as being more useful in clinical practice [3] [5] [6].

The majority of the participants agreed they married late. This was found to be statistically significant, P-value < 0.005. The majority of the participants regretted the age at which they got married, with more regrets for the increasing age at marriage. The majority of the participants agreed that the best age for marriage was before age 25. These were found statistically significant, P-value < 0.005. Most girls would not heed simple counsel for early marriage and early commencement of childbirth to avert infertility until they come face to face with the monster called infertility, when regrets become their companions [8] [18].

Among those who are currently pregnant, the majority of them got pregnant at the age bracket 21 - 25 years while 100% of those who married at the age above 40 were yet to conceive. Though this was found not to be statistically significant, P-value = 0.006, it still concurred with the reports from other studies that it is easier to conceive at or before age 25 [4] [5]. It will be necessary to let the female folks know that the number of follicles has been counted and installed in their reproductive system by God and that no new ones will be created after birth, rather, depletion of the already counted follicles commences immediately after birth till menopause. A good knowledge of this will help females make reproductive decisions to improve and preserve their fertility. Early marriage has therefore been noted to improve the average female fertility [1] [20].

6. Conclusion

The female age range at marriage with the least difficulty at conception was 21 - 25. There is increased difficulty at conception and marriage age above 25 years, with increasing difficulties as the marriage age increases. The major reasons for delayed marriage were academic pursuit and lack of gainful employment.

Recommendations

The public should be educated and enlightened on female reproduction, factors that influence it and possible ways to enhance it and avert infertility. There should be an inclusion of biological dynamics of the female reproductive behaviour as part of the core school curriculum from primary to university levels as this will help enlighten the female and the male folks alike to enable them to make informed decisions with regards to the timing of marriage and commencement of procreation. This will help reduce infertility and save millions of couples the agony associated with infertility.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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