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Assessment of the Socio-Demographic Characteristics and Follicular Performance of Ovum Donors Attending Invitro-Fertilization Clinics at Abakaliki

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ABSTRACT

Background: *Ovum donation has become an essential component of invitro fertilization (IVF) necessary for successful IVF cycles. This study is aimed at assessing the socio-demogarphic characteristics and follicular performance of ovum donors attending IVF clinics at Abakaliki.*

Method: *This study was a descriptive cross-sectional study that used a census sampling technique and a structured self-administered questionnaire proforma for data collection. Questionnaires from 423 first-time female ovum donors, who properly filled their proforma questionnaires were selected out of 444 female participants and analyzed using Statistical Package for the Social Sciences IBM, SPSS version 26 and presented in tables. P-values of ≤0.005 were considered statistically significant.*

Result: *Majority of the ovum donors, 91(21.5%) were 23 years of age. The mean age was 22.35 ± 3.435 (2 S.D). Ovum donors who were 23 years old performed better in terms of oocytes quantity and quality. This was statistically significant, p-value= 0.016. Majority of the ovum donors, 392 (92.7%) were nullipara. Nulliparous donors produced more eggs and better-quality eggs than higher parity female donors. This was statistically significant, p-value 0.000. Majority 390 (92.2%) of the donors were unmarried and had better follicular performance in quantity and quality than married donors. This was found statistically significant, p-value 0.000. Greater percentage, 87.9% (372) of donors were under graduate students. Donors who were non-smokers were more in number, 402 (95%) and had better follicular performance than smokers. This was statistically significant, p-value 0.000. Majority of the oocyte donors, 407 (96.2%) confessed they were not under any form of stress and they produced more oocytes that were of better quality than their counterparts who were under one form of stress or the other, p-value 0.024. Majority, 411 (97.2%) of the donors did not engage in at least three times per week non-strenuous sporting activities. Those who engaged in at least three times non-strenuous sporting activities had better follicular performance, p-value 0.000. Majority of the oocyte donors, 319 (75.4%) had normal body mass index (BMI) and had better follicular performance than those with abnormal (higher and lower BMI). This was statistically significant, p-value 0.000. Majority of the ovum donors, 314 (74.2%) attained menarche at age 13 and had better follicular performance in quality and quantity. This was statistically significant, p-value 0.000. Financial gratification was the main reason for ovum donation, accounting for 421 (99.5%) of the oocyte donors. The main source of recruitment of donors in this study was friends, accounting for about 385 (91.0%) of donors. This was statistically significant, p-value 0.000.*

Conclusion: *A 23-year-old, single, nulliparous female with normal BMI who is not under stress and who engages in non-strenuous sporting activities of at least three (3) times a week and who attained menarche at age 13, is likely to produce more and better-quality oocytes and should be considered as a better candidate during ovum recruitment selection exercise.*

Keywords
Socio-Demographic Characteristics, Ovum Donors, Follicular Performance, *In vitro* Fertilization, Abakaliki.

Introduction
Infertility is defined as the inability of a couple to achieve conception after 12 months of regular unprotected sexual intercourse of at least 2-3 times a week [1]. It's a global public health concern, affecting about 8-12% of couples [2]. Report from World Health Organization (WHO) suggests that one in six individuals may experience infertility at some point in their lives [3].

Procreation is regarded as a major reason for marriage in African setting and the marriage is threatened when this does not occur naturally after few years of marriage with the woman bearing greater part of the blunt [4,5].

A number of factors influence the type of fertility management offers to infertile couples and include the aetiology, the availability of fertility services and the socio-economic capabilities of the couples [6].

Since the birth of the world's first IVF baby, Loiuse Joy Brown, in the UK on July 25th, 1978, Assisted Reproductive Technology (ART) has successfully restored hope of having children by many hitherto hopeless homes [7]. *In vitro* fertilization is therefore a scientific breakthrough technology that has assisted infertile couples to have children of their own [2,3,8].

Oladapo Ashiru and his team's pioneering work in IVF, led to the birth of first IVF baby in Nigeria in 1989 [9].

The principle of ovum donation emerged in1983 [8,10] and involves the young fertile woman willingly giving out her eggs to another woman who is not capable of producing her own eggs for fertilization and creation of embryos that will be transferred to the recipient to enable her become pregnant with the opportunity of having her own children [2,7].

Since the reported case of first birth from a donor ovum in 1984, thousands of births have resulted from donor ova to bless previously hopeless families [7,11]. Ovum donation accounts for about 18% of IVF births in the USA [7].

The demand for ovum donation has grown tremendously world over [7]. Increasingly, egg donation has become a common method of treating infertility in Nigeria especially among older females who can no longer produce their own eggs and most of the donors are students [2]. This may be due to the financial demand of their academics [3]. Often times, there are no clear set out criteria for selecting and recruiting these donors and sometimes after receiving ovulation induction drugs, they produce little or no eggs to the detriment of the IVF cycles. There is paucity of data on the socio-demographic characteristics of ovum donors and their follicular performance in Abakaliki. This study is therefore set to fill this gap.

Methods
Study Area
Ebonyi state is one of the smallest states of Nigeria. In terms of land mass and population respectively, it is the 33rd largest, sitting on 6, 400km^2 and the 29th most populous state in Nigeria with an estimated population of 3,490,383 (2016 estimated population by National population Commission [12].

Geographically, Ebonyi State is located in the South-East geopolitical zone and shared boundaries with Benue State in the North, Cross-River State in the South East, Enugu State in the West and Abia State in the South West.

It was created out of the former Abia and Enugu States on October 1, 1996 with Abakaliki as its capital. It derives its name from the famous Ebonyi River which traverses the greater parts of the state.

Economically, the occupation of people of Ebonyi State is mainly agriculture (yam, cassava, rice, oil palm crops). Mining is also going on in some pockets of the state as the state is blessed with deposits of lead, zinc and rich in limestones. The gross domestic product (GDP) of Ebonyi State is estimated at $12.2 billion and $3,634 per capita. Ebonyi State has the 20th highest Human Development Index (HDI 2018) in the country [13].

Ebonyi state has three senatorial zones of North, Central and South with 13 local government areas. Abakaliki is located in Northern Senatorial zone of the state and houses two major federal tertiary health care institutions: The Alex Ekwueme Federal University Teaching Hospital and National Obstetric Fistula Centre (NOFIC) as well as many private health care facilities including Smile Specialist Hospital.

NOFIC Abakaliki is a federal tertiary institution that focuses its care mainly on female reproductive needs. It is situated in the State capital.

It started as Mother and Child Care Initiative (MCCI) in 2008 as a pet project of the wife of the second Governor of Ebonyi, Chief Mrs Josephine Elechi which cared for the women with obstetric fistula. It later transformed to South East Vesico-Vagina Fistula Centre. It was taken over and renamed National Obstetric Fistula Centre in 2011 by the Federal Government of Nigeria with six Mandates namely: Free treatment of obstetric Fistula, Research, Training, Prevention and Rehabilitation of fistula patients as well

as cancer screening/treatment with respect to cervical, breast and prostate cancers. The IVF unit of the Centre was established and became operational in 2015.

Smile Specialist Hospital is a private healthcare facility located in Abakaliki that focuses mainly on women's reproductive health needs. It was established in 2012. The IVF unit of the hospital became operational in 2014, hence, it became the first IVF Centre in the State.

The two *Invitro* Fertilization (IVF) clinics in Abakaliki, one private (Smile Specialist Hospital) and one Government (National Obstetric Fistula Centre) which started in 2014 and 2015 respectively were selected for the study.

The choice of Smile Specialist Hospital's IVF Centre is predicated on the premise that apart from the fact that the hospital hosts the first and oldest IVF unit in the state, its proximity to NOFIC makes data collection easy.

The choice of NOFIC IVF unit is predicated on the fact that it was the second IVF Centre in Abakaliki as well as its proximity to Smile Specialist Hospital.

Study Population

The study population comprised of all first-time ovum donors who willingly presented to these two Centres for egg donation and willingly gave consent to participate in the study within the study period.

Study Design

This is descriptive, cross-sectional study.

Sampling Technique/Selection Criteria

Census of all eligible first-time ovum donors within the study period who presented at the selected clinics and consented to participate in the study were used.

Sampling Size

Sample Size was determined by statistical formula for descriptive studies, and was derived from the formula:

$N=Z^2pq/d^2$ (Kadam and Bhalerao, 2010)

Where:
N= minimum sample size
z= 1.96 (95% CI)
P= Expected proportion= 0.5 (since there is no available study to pick the prevalence)
q =1-p
d =desired precision (acceptable margin of error) =0.05
$N=(1.96)^2 \times 0.5\ (1-0.5)/(0.05)^2$
N=3.8416 x0.25/0.0025=384.16
Plus 10% attrition=38.4
Sample size- 38.4+384.16=422.58
Approximately 423

Inclusion Criteria

Willing and consenting, non-recipient first-time ovum donors who willingly gave out their socio-demographic data and who willingly subjected themselves to ovarian stimulation protocols. Ovum donors who met above criteria and completed the procedure with oocyte retrieval (or did not complete the procedure because they were dropped early due to poor performances) within the study period were selected and included.

Exclusion Criteria

Excluded from the study were:
1. Ovum donors who refused to consent to the study, or refused to willingly give out their socio-demographic data
2. Ovum donors who withdrew from the stimulation protocol before oocyte retrieval
3. Ovum donors who have donated eggs in the past
4. Egg-sharers, and
5. Recipient donors.

Instrument of Data Collection

The information was collected using a well-designed data collection proforma. The proforma has two sections: A and B. Section A comprised of instrument for collecting the socio-demographic characteristics of the donors. Information on the anthropometric data of ovum donors were found in section B.

Validity of Data Collection Instrument

To ensure validity of the collection instrument, the proforma was reviewed and modified by the co-authors to ensure compliance with objectives of the study.

Reliability of The Instrument

To ensure reliability of the proforma instrument, it was pre-tested on 10 selected ovum donors. This exercise helped to identify some ambiguities with the proforma which were corrected before proceeding with data collection.

Data Collection

Six (6) Research Assistants (2 doctors and 4 nurses) who understood the three major languages of Nigeria-Hausa, Igbo and Yoruba, and the major dialects in Ebonyi State-Izzi, Ezza, Ohaozara and Afikpo, as well as the IVF terminologies and also worked routinely in IVF clinics received further training for a day and were equipped with the contents of the proforma.

The Research Assistants counseled each donor and collected information on their socio-demographic and anthropometric characteristics.

Data Analysis

Data was analyzed using Statistical Package for the Social Sciences IBM, SPSS version 26. The assistance of a Statistician conversant with this was sort to help in the analysis. Frequencies, percentages,

mean and standard deviation were used to present the results

Ethical Considerations

Ethical clearance was obtained from Research and Ethics Committee of Ebonyi State University Abakaliki (EBSU REC). Formal administrative permission was secured from the heads of the IVF Clinics used.

Confidentiality was observed and data was extracted and analyzed anonymously. All donor's information that will expose her identity were not entered into the proforma and were excluded from the data set.

All participating ovum donors gave consent in writing and were made to know that they could withdraw at any stage of the research without untoward effects.

Results

Table 1A shows that majority of the donors were 23 years old (21.5%) while age 33 formed the least (0.9%). The mean age was 22.35years ± 3.435 (2 S D). Highest number of ova (21.5%) were retrieved in donors who were 23 years of age followed by donors who were 19 years old (12.3%). The least number of ova were retrieved in donors aged 30 and above. This is statistically significant, P-value = 0.016 (Table 1B). Table 1C showed that highest number of matured ova were found among donors aged 23(21.5%). This is statistically significant, P-value = 0.017. Highest number of follicles, 208(49.2%) were retrieved in donors aged between 21-25 years. This was statistically significant, P-value = 0.038.

Table 1A: The Age Characteristics of Respondents.

Age (yrs)	Frequency	Percentage (%)
18	52	12.3
19	54	12.8
20	51	12.1
21	34	8.0
22	16	3.8
23	91	21.5
24	30	7.1
25	37	8.7
26	8	1.9
27	14	3.3
28	8	1.9
29	8	1.9
30	6	1.4
31	5	1.2
32	5	1.2
33	4	0.9
TOTAL	423	100.0
Mean age	22.35	
Median age	23.0	
Std. Deviation	3.435	

Table 1B: Total Number of Oocytes Retrieved Versus Age (yrs).

Total NO. of oocytes retrieved	18yrs (%)	19yrs (%)	20yrs (%)	21yrs (%)	22yrs (%)	23yrs (%)	24yrs (%)	25yrs (%)	26yrs (%)	27yrs (%)	28yrs (%)	29yrs (%)	30yrs (%)	31yrs (%)	32yrs (%)	33yrs (%)
0	9(2.1)	4(0.9)	4(0.9)	2(0.5)	0(0.0)	3(0.7)	0(0.0)	0(0.0)	0(0.0)	3(0.7)	6(1.4)	2(0.5)	0(0.0)	5(1.2)	3(0.7)	0(0.0)
1	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	2(0.5)	0(0.0)
2	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	7(1.7)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)
3	13(3.1)	8(1.9)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(1.4)	2(0.5)	0(0.0)	4(0.9)	2(0.5)	0(0.0)	0(0.0)	0(0.0)
4	7(1.7)	14(3.3)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)
5	3(0.7)	7(1.7)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
6	0(0.0)	4(0.9)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
7	8(1.9)	11(2.6)	14(3.3)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	1(0.2)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
8	0(0.0)	2(0.5)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
9	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	3(0.7)	4(0.9)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
10	4(0.9)	4(0.9)	3(0.7)	8(1.9)	0(0.0)	0(0.0)	4(0.9)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
11	4(0.9)	0(0.0)	3(0.7)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)
12	0(0.0)	0(0.0)	8(1.9)	6(1.4)	4(0.9)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0) 0(0.0)
13	0(0.0)	0(0.0)	5(1.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
14	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	3(0.7)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
15	0(0.0)	0(0.0)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
16	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
17	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
18	0(0.0)	0(0.0)	0(0.0)	4(0.9)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
19	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
20	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
21	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	7(1.7)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
22	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
23	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(1.4)	4(0.9)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)

24	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	11(2.6)	6(1.4)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
26	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
27	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(1.4)	0(0.0)	290.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
28	0(0.0)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	6(1.4)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
29	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
30	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
31	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
32	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
33	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
34	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	8(1.9)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
35	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
36	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
38	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(1.4)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Total	**52(12.3)**	**54(12.3)**	**51(12.1)**	**34(8.0)**	**16(3.8)**	**91(21.5)**	**30(7.1)**	**37(8.7)**	**8(1.9)**	**14(3.3)**	**8(1.9)**	**8(1.9)**	**6(1.4)**	**5(1.2)**	**5(1.2)**	**4(0.9)**

Chi-square = 1461.681, P-value = 0.016

Table 1C: Total number of matured good Oocytes versus Age (yrs).

Total number of mature good oocytes	18yrs (%)	19yrs (%)	20yrs (%)	21yrs (%)	22yrs (%)	23yrs (%)	24yrs (%)	25yrs (%)	26yrs (%)	27yrs (%)	28yrs (%)	29yrs (%)	30yrs (%)	31yrs (%)	32yrs (%)	33yrs (%)
0	9(2.1)	4(0.9)	4(0.9)	2(0.5)	0(0.0)	3(0.7)	0(0.0)	0(0.0)	0(0.0)	3(0.7)	6(1.4)	2(0.5)	0(0.0)	5(1.2)	3(0.7)	0(0.0)
1	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	2(0.5)	0(0.0)
2	0(0.0)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	7(1.7)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)
3	13(3.1)	8(1.9)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(1.4)	2(0.5)	0(0.0)	4(0.9)	2(0.5)	0(0.0)	0(0.0)	0(0.0)
4	7(1.7)	12(2.8)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)
5	3(0.7)	7(1.7)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
6	4(0.9)	4(0.9)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
7	8(1.9)	11(2.6)	14(3.3)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	3(0.7)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
8	0(0.0)	4(0.9)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
9	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	3(0.7)	4(0.9)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
10	4(0.9)	2(0.5)	3(0.7)	8(1.9)	0(0.0)	0(0.0)	4(0.9)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
11	4(0.9)	0(0.0)	3(0.7)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)
12	0(0.0)	0(0.0)	8(1.9)	6(1.4)	4(0.9)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0) 0(0.0)
13	0(0.0)	0(0.0)	5(1.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
14	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
15	0(0.0)	0(0.0)	2(0.5)	0(0.0)	2(0.5)	3(0.7)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
16	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
17	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
18	0(0.0)	0(0.0)	0(0.0)	4(0.9)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
19	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
20	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
21	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	7(1.7)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
22	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	2(0.5)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
23	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(1.4)	6(1.4)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
24	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	11(2.6)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
26	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
27	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(1.4)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
28	0(0.0)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	6(1.4)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
29	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
30	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
31	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
32	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
33	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
34	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	8(1.9)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
35	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.9)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
36	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
38	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(1.4)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Total	**52(12.3)**	**54(12.3)**	**51(12.1)**	**34(8.0)**	**16(3.8)**	**91(21.5)**	**30(7.1)**	**37(8.7)**	**8(1.9)**	**14(3.3)**	**8(1.9)**	**8(1.9)**	**6(1.4)**	**5(1.2)**	**5(1.2)**	**4(0.9)**

Chi-square = 1383.404, P-value = 0.017

Table 2: Parity of Respondents.

Parity	Frequency	Percentage (%)
Nullipara	392	92.7
1-2	29	6.9
>=5	2	.5
Total	423	100.0

Table 2 showed that majority of the donors were nullipara, 392 (92.7%). This is statistically significant, Chi-square = 51.541, P-value= 0.000.

Table 3A shows that majority of the donors, 390 (92.2%) were single. Majority, 412(97.4%) attended tertiary education or are currently in tertiary institution while greater number, 372 (87.9%) were undergraduate students.

Table 2B: Parity Vs Total Oocytes Retrieved.

PARITY	0(%)	1-5(%)	6-10(%)	11-15(%)	16-20(%)	21-25(%)	26-30(%)	31-35(%)	36-40(%)	Total (%)
Nullipara	27(6.4)	82(19.4)	94(22.2)	51(12.1)	26(6.1)	46(10.9)	30(7.1)	26(6.10	10(2.4)	392(92.7)
1-2	14(3.3)	11(2.6)	0(0.0)	4(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	29(6.9)
3-4	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
≥5	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.5)
Total	**41(9.7)**	**95(22.5)**	**94(22.2)**	**55(13.0)**	**26(6.1)**	**46(10.9)**	**30(7.1)**	**26(6.1)**	**10(2.4)**	**423(100.0)**

n= 423

Table 3A: Marital/Educational and Occupational characteristics of Respondents.

Marital status	Frequency	Percentage (%)
Single	390	92.2
Married	33	7.8
Total	423	100.0
Highest Education attained	**Frequency**	**Percentage (%)**
Primary	0	0.0
Secondary	11	2.6
Tertiary	412	97.4
Total	423	100.0
Occupation	**Frequency**	**Percentage (%)**
Undergraduate students	372	87.9
Teachers	4	0.9
Civil Servants	30	7.1
Artisans	11	2.6
Bankers	2	0.5
Business	4	0.9
Total	423	100.0

Table 3B: Marital status versus number of matured, good oocytes retrieved.

No. of matured, good Oocytes retrieved	SINGLE	MARRIED
0	26(6.1)	15(3.5)
1	2(0.5)	4(0.9)
2	13(3.1)	4(0.9)
3	33(7.8)	4(0.9)
4	21(5.0)	0(0.0)
5	14(3.3)	0(0.0)
6	10(2.4)	0(0.0)
7	40(9.5)	0(0.0)
8	15(3.5)	0(0.0)
9	8(1.9)	0(0.0)
10	23(5.4)	0(0.0)
11	11(2.6)	4(0.9)
12	18(4.3)	0(0.0)
13	5(1.2)	0(0.0)
14	11(2.6)	0(0.0)
15	6(1.4)	0(0.0)
17	490.9)	0(0.0)
18	8(1.9)	0(0.0)
19	4(0.9)	0(0.0)
20	8(1.9)	0(0.0)
21	7(1.7)	2(0.5)
22	6(1.4)	0(0.0)
23	14(3.3)	0(0.0)
24	17(4.0)	0(0.0)
26	4(0.9)	0(0.0)
27	8(1.9)	0(0.0)
28	10(2.4)	0(0.0)
29	6(1.4)	0(0.0)
30	2(0.5)	0(0.0)
31	2(0.5)	0(0.0)
32	4(0.9)	0(0.0)
33	4(0.9)	0(0.0)
34	10(2.4)	0(0.0)
35	6(1.4)	0(0.0)
36	4(0.9)	0(0.0)
38	6(1.4)	0(0.0)
TOTAL	**390(92.2)**	**33(7.8)**

Chi Square = 117.683, P-value = 0.000

Table 3B showed that donors who were single produced higher number of good and mature oocytes than married donors This is statistically significant, p-value= 0.000.

Table 4A shows that majority of the donors were non-cigarette smokers, 402 (95.0%). Majority of the donors were not engaged in sporting activities up to at least three (3) times a week, 411(97.2%), while majority of the donors, 407 (96.2%) confessed they were not under any form of stress.

Table 4B shows that non-smokers performed better in oocytes production than smokers. This is statistically significant, p-value = 0.000.

Table 4A: Social lives (smoking, sporting and stress) of Respondents.

Smoking status	Frequency	Percentage (%)
Yes	21	5.0
No	402	95.0
Total	423	100.0
Type of smoking	**Frequency**	**Percentage (%)**
None	402	95.0
Cigarette	21	5.0
Total	423	100.0
Sporting of at least x3/wk	**Frequency**	**Percentage**
Yes	12	2.8
No	411	97.2
Total	423	100.0
Under Stress	**Frequency**	**Percentage (%)**
Yes	16	3.8
No	407	96.2
Total	423	100.0

Table 4B: Smoking Status versus total Oocytes retrieved.

Total Oocytes Retrieved	Smoking	Non-smoking
0	13(3.1)	28(6.6)
1	0(0.0)	4(0.9)
2	0(0.0)	11(2.6)
3	6(1.4)	33(7.8)
4	0(0.0)	27(6.4)
5	0(0.0)	14(3.3)
6	0(0.0)	6(1.4)
7	0(0.0)	36(8.5)
8	0(0.0)	10(2.4)
9	0(0.0)	15(3.5)
10	0(0.0)	25(5.9)
11	0(0.0)	15(3.5)
12	0(0.0)	20(4.7)
13	0(0.0)	5(1.2)
14	0(0.0)	11(2.6)
15	0(0.0)	4(0.9)
16	0(0.0)	2(0.5)
17	0(0.0)	4(0.9)
18	0(0.0)	8(1.9)
19	0(0.0)	4(0.9)
20	0(0.0)	8(1.9)
21	0(0.0)	9(2.1)
22	0(0.0)	6(1.4)
23	0(0.0)	14(3.3)
24	0(0.0)	17(4.0)
26	0(0.0)	4(0.9)
27	0(0.0)	8(1.9)
28	0(0.0)	10(2.4)
29	0(0.0)	6(1.4)
30	0(0.0)	2(0.5)
31	0(0.0)	2(0.5)
32	0(0.0)	4(0.9)
33	0(0.0)	4(0.9)
34	0(0.0)	10(2.4)
35	0(0.0)	6(1.4)
36	0(0.0)	4(0.9)
38	0(0.0)	6(1.4)
TOTAL	**21(5.0)**	**402(95.0)**

Chi Square = 87.064; P-value = 0.000

Table 4C: Non-Strenuous sporting activities of at least x3/wk versus total Oocytes retrieved.

Total Oocytes retrieved	Sporting at least x3/wk	Non-sporting of at leastx3/wk
0	6(1.4)	35(8.3)
1	0(0.0)	4(0.9)
2	0(0.0)	11(2.6)
3	0(0.0)	39(9.2)
4	0(0.0)	27(6.4)
5	0(0.0)	14(3.3)
6	0(0.0)	6(1.4)
7	2(0.5)	36(8.5)
8	0(0.0)	10(2.4)
9	0(0.0)	15(3.5)
10	0(0.0)	25(5.9)
11	0(0.0)	15(3.5)
12	0(0.0)	20(4.7)
13	0(0.0)	5(1.2)
14	2(0.5)	9(2.1)
15	2(0.5)	2(0.5)
16	0(0.0)	2(0.5)
17	0(0.0)	4(0.9)
18	0(0.0)	8(1.9)
19	0(0.0)	4(0.9)
20	0(0.0)	8(1.9)
21	0(0.0)	9(2.1)
22	0(0.0)	6(1.4)
23	0(0.0)	14(3.3)
24	0(0.0)	17(4.0)
26	0(0.0)	4(0.9)
27	0(0.0)	8(1.9)
28	0(0.0)	10(2.4)
29	0(0.0)	6(1.4)
30	0(0.0)	2(0.5)
31	0(0.0)	2(0.5)
32	0(0.0)	4(0.9)
33	0(0.0)	4(0.9)
34	0(0.0)	10(2.4)
35	0(0.0)	6(1.4)
36	0(0.0)	4(0.9)
38	0(0.0)	6(1.4)
Total	**12(2.8))**	**411(97.2)**

Chi Square = 40.740 (FISCHER'S EXACT TEST); P-value = 0.024

Table 4C shows that those who engaged in at least three times (3) per week of non-stressful sporting activities were more likely to produce more oocytes. This is statistically significant, p-value = 0.024.

Table 5: Source of Motivation.

Source	Frequency	Percentage (%)
Help Recipients	2	0.5
Financial gratification	421	99.5
Total	423	100.0

Table 5 shows that the main reason for egg donation in this study was financial gratification. Majority, 421 (99.5%) of donors donated for the single reason of financial gains.

Table 6: Source of Recruitment.

Source	Frequency	Percentage (%)
Came on my own	2	0.5
Friends	385	91.0
Online	28	6.6
Classmate	9	1.9
Total	423	100.0

Table 6 shows that the main source of recruitment of donors in this study was friends, accounting for about 385 (91.0%) of donors.

Table 7: The Body Mass Index (BMI) characteristics of Respondents.

BMI(kg/m^2)		Frequency	Percentage
Valid	16.00	4	.9
	16.50	2	.5
	16.70	2	.5
	17.00	2	.5
	17.10	2	.5
	17.30	6	1.4
	17.40	6	1.4
	17.50	7	1.7
	17.60	6	1.4
	17.70	2	.5
	17.80	4	.9
	17.90	2	.5
	17.99	4	.9
	18.00	8	1.9
	18.08	2	.5
	18.10	12	2.8
	18.20	4	.9
	18.30	12	2.8
	18.40	13	3.1
	18.50	6	1.4
	18.60	11	2.6
	18.65	2	.5
	18.70	11	2.6
	18.75	2	.5
	18.80	10	2.4
	18.90	10	2.4
	19.00	4	.9
	19.10	20	4.7
	19.30	12	2.8
	19.40	16	3.8
	19.50	6	1.4
	19.60	2	.5
	19.70	10	2.4
	19.80	2	.5
	19.90	4	.9
	20.00	6	1.4
	20.10	2	.5
	20.11	2	.5
	20.20	2	.5
	20.30	4	.9
	20.60	2	.5
	20.70	4	.9
	20.80	6	1.4
	20.90	2	.5
	21.00	2	.5
	21.10	2	.5
	21.25	4	.9
	21.30	5	1.2
	21.50	2	.5
	21.60	4	.9
	21.70	3	.7
	21.80	7	1.7
	21.90	2	.5
	22.00	2	.5
	22.10	5	1.2
	22.40	8	1.9
	22.60	2	.5
	22.70	2	.5
	23.00	6	1.4
	23.20	10	2.4
	23.50	2	.5
	23.60	3	.7
	23.90	4	.9
	24.00	6	1.4
	24.20	4	.9
	24.30	5	1.2
	24.40	4	.9
	24.60	4	.9
	25.10	4	.9
	25.20	2	.5
	25.30	6	1.4
	25.80	3	.7
	26.10	3	.7
	26.30	4	.9
	26.50	3	.7
	26.60	7	1.7
	26.90	4	.9
	27.40	4	.9
	27.70	2	.5
	27.90	3	.7
	28.40	3	.7
	28.60	4	.9
	29.70	2	.5
	31.10	3	.7
	31.25	4	.9
	31.30	4	.9
	31.60	2	.5
	Total	423	100.0

P-value = 0.000; Chi-Square = 4493.329

Table 7 shows that majority of the donors (4.7%) had BMI of 19.0kg/m^2 while 319 donors (75.4%) of donors had normal BMI of 18 to 25.5kg/m^2. Donors with normal BMI produced more oocytes. This is statistically significant, chi-square = 4493.329; p-value=0.000.

Table 8: Age of Menarche of Respondents.

Age (yrs)	Frequency	Percentage (%)
11	10	2.4
12	27	6.4
13	314	74.2
14	72	17.0
Total	423	100.0

Table 8 shows that majority of the donors, 314 (74.2%) attained menarche at age 13 followed by age 14. The relationship between age of menarche and oocytes production is statistically significant, chi-square = 106.002, p-value=0.000.

Table 8B: Menarche Vs Total Oocytes Retrieved.

MENARCHE (years)	0(%)	1-5(%)	6-10(%)	11-15(%)	16-20(%)	21-25(%)	26-30(%)	31-35(%)	35-40(%)	Total
11	4(0.9)	6(1.4)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	10(2.4)
12	8(1.9)	17(4.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	27(6.4)
13	19(4.5)	58(13.7)	76(18.0)	37(8.7)	26(6.1)	38(9.0)	28(6.6)	26(6.1)	6(1.4)	314(74.2)
14	10(2.4)	14(3.3)	16(3.8)	18(4.3)	0(0.0)	8(1.9)	2(0.5)	0(0.0)	4(0.9)	72(17.0)
Total	41(9.7)	95(22.5)	94(22.2)	55(13.0)	26(6.1)	46(10.9)	30(7.1)	26(6.1)	10(2.4)	423(100)

n=423; Chi-Square – 106.002; P=0.000

Discussion

This study showed that majority of the donors were aged 23 years. This is not unexpected because this is the age bracket when most of them are in the university. Donors who were 23 years of age produced more ova in general, and more matured ova in particular than other age brackets. Age is a critical factor in ovum donation. Advanced age negatively affects follicular performance in ovum donors, leading to decreased egg quality and quantity with increased age. This is due to a reduction in ovarian reserve and oocyte competence, which can result in lower energy production and a higher frequency of chromosome mis-segregation. Younger ovum donors generally have a better ovarian reserve. However, some very young women may also experience challenges [14]. While there is a clear correlation between increasing maternal age and decreasing ovarian reserve with consequent decreased follicular performance [14], data on follicular performance in very young women is sparse. Poorer reproductive performance in very young patients ≤ 25years in terms of quality of embryos has been documented [15]. Though Obuna and Nwidagu reported that the fertility of a female increases and reaches peak at age 25 [1], no factor from this study can clearly be adduced as to why it is age 23 that gave the highest ova instead of age 25. May be further studies are needed to unravel this.

Majority of the ovum donors in this study were undergraduate students. This is in consonance with other studies which reported that majority of the willing egg donors were university undergraduates [7,16,17]. When this finding is coupled with the fact that the main motivating factor for willingness to donate eggs in this study was financial gratification, one can easily conclude that the financial demands posed by their academics and the global economic down-turn, especially in Nigeria, may be the reason why majority of the willing egg donors are undergraduate students. This was corroborated by other studies [8,16,18].

In this study, majority of the ovum donors were single and nulliparous. This finding is similar to other studies [8,16,17]. The study also showed that highest number of matured oocytes were produced and retrieved from unmarried and nulliparous donors. The relationship between marital status, parity and quality as well as quantity of oocytes produced and retrieved by egg donors was statistically significant. This is expected because majority of the donors were still very young, 23 years, and undergraduates.

Studies have shown that nowadays females tend to defer marriage in favour of pursuit of academics [19]. More so, in this part of the world, it is not common for unmarried females to engage in procreation [1], therefore, it is more likely that once a female is single, she will also be nulliparous.

Majority of the donors in this study had normal body mass index (BMI). It also showed that egg donors with normal BMI had better follicular performance in terms of quantity and quality. This was found to be statistically significant. Female fertility is sensitive to body weight. A critical threshold of body fat is required for girls to enter puberty and a critical body weight must be attained by a female for effective follicular performance [20,21]. A BMI between 18 and 25 kg/m^2 is generally considered healthy for follicular performance [20].

Abnormal BMI (obesity and under-weight) has been shown to be detrimental to the follicular environment [20,21]. There are more oxygen reactive species in obese females, hence, more oxidative stress in females with high BMI. This has been found to interfere with both the quantity and quality of oocytes produced [20]. It is therefore not surprising that egg donors with normal BMI in this study performed better than egg donors with abnormal BMI.

Although majority of the egg donors in this study did not engage in at least three (3) non-strenuous sporting activities per week, the study however showed that those who engaged in at least three (3) non-strenuous sporting activities produced better oocytes in terms of quantity and quality than those who did not engage in non-strenuous sporting activities of at least three (3) times a week. This is not surprising because it has been shown that non-strenuous exercise of at least three (3) times a week improves follicular performance in women of reproductive age group [22].

Majority of the ovum donors were non-cigarette smokers and those who did not smoke cigarette had better follicular performance than smokers. This was statistically significant. This is expected because cigarette smoking has been shown to negatively affect follicular environment, hence, leading to poor follicular performance [23].

Majority of the donors confessed that they were not under any form of stress (physical or psychological). This may have contributed among other factors to the reason majority of them produced good quantity and quality oocytes. Stress has been shown to be detrimental to follicular performance in terms of quality and quantity [24,25].

Majority of the oocyte donors in this study attained menarche at age 13 and were found to produce more eggs in general and more matured eggs in particular. Normal menarche occurs at age between 12 and 14 [26]. This was found to be statistically significant. This study therefore shows that normal menarche favours good follicular performance in ovum donors. While age of menarche is not a direct measure of good ovarian performance, however, it may signify the general fertility integrity of such females. Early or late menarche can be a risk factor for diminished ovarian function and fertility issues later in life [27]. Late menarche may signal underlying issues such as polycystic ovarian syndrome (PCOS) or other underlying hormonal imbalance which may affect female fertility [27]. Menstruation is known to be a window through which the fertility of female is viewed [1]. Commencing menstruation at age 13 may probably demonstrate that the fertility of such female is high which is a sign of good ovarian environment.

Majority of the donors were recruited through their friends who had donated eggs in the past. This is in consonance with other studies [3,7]. This is not surprising because, advertisement of health programs by orthodox health facilities are generally not allowed in our environment and so, IVF operators, like other healthcare practitioners generally rely on neighbours telling neighbours about healthcare activities. So, students tend to tell their fellow students about the egg donation.

In conclusion, majority of the egg donors in this study were aged 23, unmarried, nulliparous, undergraduate students and with normal BMI. These characteristics were seen to significantly favourably influence egg production in terms of quantity and quality. The major reason for egg donation was financial gratification and the major source of recruitment was friends. Therefore, when there is need to select and recruit an egg donor, age 23, single, nulliparous female with normal BMI who is not under stress and who engages in non-strenuous sporting activities of at least three (3) times a week and whose menarche is normal (at age 13), may be considered as favourable factors.

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