

# Knowledge of Oocyte Donation procedure and Health Consequences: a Cross-Sectional Survey of Female Undergraduates in North-Central Nigeria

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## ABSTRACT

Egg donation is a form of assisted reproductive technology used to help women with infertility. Though, egg donation might attract some material benefit, potential egg donors often do not have knowledge of the associated health risks. This study investigated knowledge of female undergraduates in Kwara State, north central Nigeria, about oocyte donation to infertile couples. It was a descriptive cross sectional study carried out in 2018 involving 559 female undergraduates recruited through a multi-stage sampling technique. An adapted questionnaire validated and tested for reliability was used for data collection. Data were analysed using IBM SPSS version 25 software. Descriptive statistics of frequency count and percentages were used to answer research questions and Chi-square employed to test the hypotheses at  $\leq 0.05$  level of significance. Majority of the respondents were 15-20 years old (66.3%, 371) unmarried (96.8%, 541), Muslims (60.5%, 338), Yoruba (82.8%, 463), first year students (54.4%, 304). Most of the respondents had poor knowledge on oocyte donation (60.3%, 337); poor knowledge of oocyte donation procedure (69.9%, 391) and poor knowledge of the health risks associated with oocyte donation (65.5%, 366). The study revealed that female undergraduates in the study area have poor knowledge of oocyte donation, its procedure and the attendant health consequences. Universities in the study area should include oocyte donation as a topic in General Studies (GNS) in order to equip students with adequate information on potential benefits and drawbacks of oocyte donation.

**Keywords:** Female undergraduates, Knowledge, North-central Nigeria, Oocyte donation, Oocyte donation risks



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## INTRODUCTION

In a simplified concept, oocyte donation can be described as the process by which a woman donates eggs to enable another woman to conceive as part of an assisted reproduction treatment or for biomedical research. Oocyte donation is a Western concept that came about consequent on advancement in medical research.<sup>1</sup> It is a form of treatment that includes the use of fertility medications to stimulate super ovulation (in the donor), ultrasound-guided laparoscopic egg retrieval and in-vitro fertilization of egg with spouse/donor sperm to form an embryo<sup>2</sup> During the process of egg donation, eggs (oocytes) from another person (usually between the ages of 20 to 30) are fertilized with sperm from the intended parent or designated sperm donor and transferred into the uterus of the patient who is trying to conceive.<sup>3</sup> Egg donation is mostly applied for the group of patients with terminated ovarian functions such as menopausal or ovariectomized patients. Other patient populations are women with genetic disease or women who had received chemotherapy or radiotherapy at a young age and patients who have experienced recurrent miscarriages because of chromosomal abnormalities.<sup>4</sup> The age of the egg recipient is not a limiting factor for the success rate.<sup>5</sup> Therefore, women of all ages may have children with egg donation. According to Purewal et al,<sup>6</sup> there are two distinct groups of egg donors; patient donors' (women who agree with their infertility clinic to donate a proportion of their eggs for the treatment of others so that they can receive subsidized infertility treatment) and 'non-patient donors' which include different sub-types; volunteer donors (donation without financial reward), known donors (donation to known recipients), commercial donors (donation with monetary compensation) and potential donors (women who report an intention to donate their eggs in the research literature). Although, there has been a slow public acceptance of this third-party conception, oocyte donation has nevertheless

become a popular method of treatment for infertility over time.<sup>6</sup> In actual fact, several thousand children are being born by conception through oocyte donation every year.<sup>7</sup> Oocyte donation has, however, generated worldwide discussion involving its ethical, social, and psychological issues and risks.<sup>8</sup> Awareness on egg donation was found to be high (70.5%) among study participants in a retrospective evaluation of egg donor experiences in the United States,<sup>9</sup> and their sources of awareness about oocyte donation were through advertising articles/reports in print or broadcast media. Even though knowledge of participants on egg donation in general was fairly good, they had inadequate knowledge of health consequence of oocyte donation.<sup>9</sup> Similarly, Uslu et al.<sup>4</sup> reported that majority (66.9%) of their study participants have poor knowledge of oocyte donation. In addition, Tulay and Atilan<sup>10</sup> reported a low level (38%) of awareness of oocyte donation procedures and its attendant medical risks. Other researchers have made similar assertions.<sup>8,11,12</sup> We observed that many studies have compiled extensive data on attitudes of oocyte recipients,<sup>13</sup> attitudes of the health workers<sup>6</sup> and motivators of oocyte donors;<sup>6,14-17</sup> with a paucity of data on knowledge of potential oocyte donors about the procedure and its health consequences.<sup>9,12,18</sup> We also observed that majority of the oocyte donors usually recruited for Assisted Reproductive Technology (ART) were female students in higher institutions of learning who were probably motivated by the financial compensation; and were probably unaware of the consequence of their action. It was on these grounds that we investigated the knowledge of female undergraduates in Kwara State, north central Nigeria about oocyte donation and its health consequences

## MATERIALS AND METHODS

This was a descriptive cross sectional study carried out among female undergraduates in Kwara State, north-central, Nigeria in 2018. The State was created in 1967 and is currently one of the 36 states in Nigeria located in the north central region. It forms the gateway between the northern and southern part of the country and has a projected population of 3,192,900 (NPC 2016) and an annual growth rate of 3.0.

As at the time of this study, there were 6 universities, 4 Polytechnics and 4 colleges of education in the State. The population for the study comprised female undergraduates in Kwara State (Al-hikmah University Ilorin, Crown Hill University Eiyenkorin, Kwara State University Malete, Landmark University Omu-aran, Summit University Offa and University of Ilorin, Ilorin) totalling 26, 067. The target population for this study was total number of female undergraduates in University of Ilorin (18, 644), Kwara State University (909) and Al-Hikmah University Ilorin (3007). (Universities' Records, 2018). In all, the target population for the study was 22,560.

The sample size was estimated at 379 using Research Advisor. A 10% non-response rate was anticipated and this increased the sample size to 417; however, 559 respondents participated in the study. Multi-stage sampling procedure was used to recruit 10% (559) of the target population (5,558 female undergraduates from 3 out of the 6 universities Kwara state registered for the 2017/2018 academic year). In stage one, purposive sampling technique was used to select the only Federal university (University of Ilorin, Ilorin), and State university (Kwara State University, Malete). In stage two, simple random sampling technique of fish bowl type was used to select one (Al-Hikmah University) out of the four private Universities in the State (Al-Hikmah, Landmark, Summit and Crown Hill Universities). In stage three, simple random sampling by balloting without replacement was used to select five faculties from University of Ilorin; and this

procedure was repeated for the other two universities. In university of Ilorin (Unilorin), Faculties of Basic Medical Sciences, Education, Law, Pharmaceutical Sciences, and Veterinary Medicine were selected. In Kwara State University (KWASU), Colleges of Agriculture and College of Pure and Applied Sciences were selected; while Faculties of Management and Natural Sciences were selected in Al-hikmah University. Proportionate allocation was used to select 10 percent of the female students in each of the faculties /schools. Lastly, simple random sampling technique was used to select the final respondents from their various faculties/schools resulting in a total of 559 female students recruited as the final respondents for the survey (Table 1). An adapted, content-validated questionnaire was used to collect the data for the study. The questionnaire had four sections namely: sections A, B, C and D. Section A elicited information on the sociodemographic data of the respondents; section B gathered information on knowledge on egg donation in general, section C assessed knowledge of procedure/processes involved in egg donation and section D assessed knowledge of health consequences of egg donation. The questionnaire was validated by experts and subjected to a reliability test, where reliability co-efficient of 0.86 was obtained, using Spearman Brown's split half technique.

We administered questionnaire to consenting students during their lecture-free periods in their respective faculties. Filled copies of the questionnaire were checked for completeness, sorted and coded before data entry into an IBM computer. Data were analysed using IBM Statistical Package for Social Sciences (SPSS) version 25. A 'Yes' or 'No' response mode was used to analyse knowledge of female undergraduates. Descriptive statistics of frequency counts and percentages were used to answer the research questions, while Chi-square was used to test the hypotheses at 0.05 alpha level of significance.

## RESULTS

Findings from this study revealed that two-thirds of the respondents 371(66.3%) were within 15-20 years' age group (Table 2). Almost all the respondents were single 541(96.8%) while those of the Islamic faith (Muslims) were in the majority 338 (60.5%). More than four-fifth of the respondents were students of Unilorin (a public

**Table 1: Sample distribution of female students from the various Universities in Kwara State**

University	S/N	Faculties and Colleges	No of female students	10%
University of Ilorin, Ilorin	1	Basic Medical Sciences	438	44
	2	Education	3576	358
	3	Law	422	42
	4	Pharmaceutical Sciences	114	11
	5	Veterinary Medicine	64	6
Kwara State University, Malet	1	College of Agricultural Science	16	2
	2	College of Pure and Applied sciences	178	18
Al-Hikmah University, Ilorin	1	Faculty of Management Sciences	300	30
	2	Faculty of Natural Sciences	477	48
<b>Total</b>	<b>9</b>		<b>5,585</b>	<b>559</b>

Source: Researcher's field survey (2018)

university) 461(82.4%). Majority of the respondents 304 (54.4%) in this study were in 100 Level and were Yoruba by tribe 463 (82.8%). Table 3 reveals that few of the respondents knew that oocyte donation could be a better alternative to child adoption 75(13.4%). Majority, however, knew that half pair of the genetic material could be gotten from the recipient 460 (82.3%). However, when considering egg donation in general, more than half of the respondents 337 (60.3%) had poor knowledge on oocyte donation. Majority of the respondents knew that oocytes can be donated by presumably fertile female and that the process may involve surgical operation. Yet, when the aggregate knowledge on the procedure was considered more than two-thirds of the respondents 391 (69.9%) had poor knowledge of oocyte donation procedure (Table 4). Similarly, about two-thirds of the

**Table 2: Socio-demographic characteristics of respondents**

Variables	Frequency (%)	N=559
<b>Age groups</b>		
15 – 20	371 (66.3)	
21 – 25	171 (30.6)	
26 – 30	15 (2.7)	
31 – 35	2 (0.4)	
<b>Marital status</b>		
Single	541 (96.8)	
Married	17 (3.0)	
Divorced	1 (0.2)	
<b>Religion</b>		
Christianity	221 (39.5)	
Islam	338 (60.5)	
<b>Institution</b>		
Unilorin	461 (82.4)	
Kwasu	20 (3.6)	
Alhikma	78 (14.0)	
<b>Ethnicity</b>		
Yoruba	463 (82.8)	
Hausa/Fulani	35 (6.3)	
Igbo	15 (2.7)	
Others	46 (8.2)	
<b>Level</b>		
100L	304(54.4)	
200L	130(23.3)	
300L	62(11.1)	
400L	57(10.2)	
500L	6(1.1)	

respondents 366 (65.5%) had poor knowledge of the health risks associated with oocyte donation. Majority of the respondents did not know that oocyte donors may experience surgical risks such as bleeding and infection 382(68.3%) while barely a third of the respondents knew that oocyte donors could experience abdominal pain post donation and could develop ovarian and uterine cancer as late complications (Table 5).

**Table 5: knowledge of respondents on health risks involved in oocyte donation**

VARIABLES	YES N (%)	NO N (%)
<b>Health Consequences of oocyte donation</b>		
Oocyte donor may experience (excessive oocyte release from her ovary) ovarian hyper stimulation	161(28.8)	398(71.2)
Oocyte donor may experience surgical risk including bleeding and infection	177(31.7)	382(68.3)
Oocyte donor may suffer injury, scarring and twisting damage to her ovary	153(27.4)	406(72.6)
Oocyte donor run the risk of cancer/ovarian cancer/ uterine cancer	216 (38.6)	343 (61.4)
Oocyte donor may experience abdominal pain	165 (29.5)	394 (70.5)
Oocyte donor may experience mood changes /irritability	217 (38.8)	342 (61.2)
Oocyte donor may experience headaches	198 (35.4)	361 (64.6)
Oocyte donor may experience bloating (fattening in the abdomen)	186 (33.3)	373 (66.7)
Oocyte donor may experience fatigue	215 (38.5)	344 (61.5)
Oocyte donor may experience nausea	243 (43.5)	316 (56.5)
<b>AGGREGATE (PERCENTAGE)</b>	<b>193(34.5)</b>	<b>366 (65.5)</b>

**Table 4: Knowledge of respondents on oocyte donation procedure**

VARIABLES	YES N (%)	NO N (%)
<b>Oocyte donation procedure</b>		
Oocyte donors should have attained their legal maturity age of 18 years; and preferably be between the ages of 21 and 34 years.	103(18.4)	456(81.6)
Oocyte can be donated by presumably fertile female	105(18.8)	454(81.2)
Oocyte donation involves withdrawal of oocyte through surgical operation	152 (27.2)	407(72.8)
Oocyte donation involves taking of stimulating drug by the donor	165(29.5)	394(70.5)
Oocyte donation involves taking of injection	411(73.5)	148(26.5)
Oocyte donor Will be screened for genetic diseases prior to donation	120(21.5)	439(78.5)
Oocyte donors will be screened for infectious diseases before donation	119(21.3)	440(78.7)
<b>Aggregate (percentage)</b>	<b>168 (30.1)</b>	<b>391(69.9)</b>

**Table 3: Knowledge of respondents on oocyte donation in general**

VARIABLES	YES N (%)	NO N (%)
<b>Oocyte Donation knowledge</b>		
Oocyte donation is an alternative method to adoption.	75 (13.4)	484 (86.6)
In oocyte donation, embryo's half pair genetic material can be obtained from the infertile couples	99 (17.7)	460 (82.3)
Oocyte donation involves two women: the donor and the Woman who wishes to be pregnant.	475 (85.0)	102(15.0)
Women of all ages may have children with oocyte donation	203 (36.3)	356(63.7)
The age of the woman to whom the oocyte will be transferred is not a limiting factor for the success rate	257 (46.0)	302(54.0)
<b>AGGREGATE (PERCENTAGE)</b>	<b>222(39.7)</b>	<b>337(60.3)</b>

## DISCUSSION

The result shows that less than half of female undergraduates in the study area had good knowledge of oocyte donation (39.7%). This finding corroborates the report of Uslu and his co-workers<sup>4</sup> in their study on knowledge and perception about oocyte donation in Turkey where a similar proportion of study participants (33.1%) had good knowledge of oocyte donation. This finding, however, contrasts sharply with the finding of Kenney and McGowan<sup>9</sup> where majority (70.5%) of the participants were knowledgeable about oocyte donation. According to the submission of Nancy et al, egg donation is a complicated procedure which not only consumes time but also gives discomfort to both the donor and the recipient.<sup>7</sup> This study found that less than a third (30.1%) of female undergraduates of Universities in the study area had good knowledge of procedure/processes involved in oocyte donation to infertile couples. This finding agrees with the finding of Tulay and Atilan<sup>10</sup> from a study on Oocyte Donors' Awareness on Donation Procedure and Risks who reported that only 38% of donors were fully aware of all the procedures, the fate of the oocytes, and the medical risks. Oocyte donation is an involving and time-consuming procedure. It is unpleasant, and at times painful, and can have short and long-term health consequences for the donor. Donors experience drug

side effects such as mood swings, breast tenderness, headaches, hot flashes, vaginal dryness, fatigue, sleep problems, and body aches and rarely, an increased risk of ovarian hyper stimulation syndrome and uterine cancer (Egg Donor Information Project, 2006). This study discovered that only one out of three (34.5%) female undergraduates of Universities in in the study area had good knowledge of health consequences of oocyte donation to infertile couples. This finding is similar to the finding from the study of Tulay and Atilan<sup>10</sup> which confirmed that both first time and previous oocyte donors who participated in their study did not have good knowledge of long-term medical risks of oocyte donation. The authors further submitted that donors reported that though, they were relatively well informed about the fate of the oocytes before and during the donation procedure, they were least informed about the long-term medical risks. The study equally revealed that the donors were not well informed about the short-term medical risks such as risks associated with anaesthesia, infection/bleeding after oocyte collection, and bruising from injections/withdrawal of blood. The finding (of poor knowledge of health consequences of egg donation) from this study equally agrees with the report of Kenney and McGowan<sup>9</sup> that there was inadequate

knowledge of health consequence of oocyte donation among their study participants as the proportion of the respondents who indicated being aware of any one of the various physical risks that could be associated with hormonal treatment and/or oocyte harvesting before initiating treatment was surprisingly low. This study finding was also in line with the finding from the study of Bernsen et al<sup>19</sup> who reported that most of the undergraduate College women in Ohio State University lacked adequate knowledge of the risks involved in the process of oocyte donation.

## CONCLUSION

Female undergraduates in the study area had poor knowledge of oocyte donation, poor knowledge of oocyte donation procedure as well as poor knowledge of the health risks associated with oocyte donation. Universities in the study area should include oocyte donation as a topic in General Studies (GNS) in order to equip students with adequate information about oocyte donation. Similarly, health education departments should include concept of oocyte donation as a contemporary health issue in both undergraduate and postgraduate curricula.

## Limitations

The study was limited by the characteristic of our study population and their geographical setting. The study was carried out in the north central region which is one out of the six geopolitical zones of the country. Hence, the need to exercise caution in generalising the findings to all female undergraduates in the country.

## Ethics considerations

Ethical approval was obtained from the University of Ilorin Ethics Committee (UERC Approval number: UERC/ASN/2018/1406), while written informed consents of the participants was also sought after reassuring them of confidentiality. The data and the analysis of this study are available in case a reasonable

request is made to the corresponding author

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