Empowering Perspectives: Assessing the Effect of an Instructional Program on Female Students' Knowledge, Attitudes, and Challenges Towards Egg-Freezing.

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Abstract

Egg freezing has become a widespread phenomenon over the past ten years, and with the increase in the age of marriage and the lack of opportunities available to women, developments in egg-freezing technology have given women an opportunity to control their reproductive prospects. **This study aims** to evaluate the effect of an instructional program on female students' knowledge, attitude, and challenges. towards egg-freezing. **Design**: A quasi-experimental research design was utilized in this study.**Setting:** The study was conducted in the Faculty of Nursing at Kafr El-Sheik University. Egypt. **Sample:** A convenience sampling approach chose 200 female students. These female faculty students are in 1st, 2nd, 3rd, and 4th grades. **Tools:** a structured interview questionnaire involved three tools; demographic data, Egg-freezing knowledge, attitude assessment tools, and challenges assessment tools. **Result:** The findings demonstrated significant improvements in the overall knowledge and attitude levels of female students regarding egg freezing after the instructional program, as compared to their pre-program levels. This improvement was observed in all knowledge and attitude items, with a statistical significance of $p \leq 0.001$. Additionally, there was a notable reduction in the challenges faced by female students concerning egg freezing following the implementation of the instructional program. This reduction was highly statistically significant, with a difference observed at $p<0.001$. **Conclusion:** This study concluded that the female students' knowledge, attitude, and challenges will be improved after implementing the instructional program regarding egg freezing. **Recommendation:** Continuing health educational programs to improve knowledge and attitude regarding egg freezing and other research on the problems that women face during egg freezing.

Keywords: Egg -freezing**,** instructional program on female students, knowledge, attitude, and challenges

Introduction:

Social and economic considerations are assumed to cause the delay in marriage. Thanks to the accessibility of egg freezing and the vitrification procedure, women who want to postpone their pregnancy may now utilize their oocytes at a later stage, rather than relying on donated oocytes. A fertility preservation technique called egg freezing (EF) has the pregnancy potential fertility past the average woman's reproductive cycle. Using assisted reproductive technology (ART), eggs are obtained, vitrified to

preserve them, and then stored until in vitro fertilization (IVF) can be utilized to produce embryos. **Abdelwahab, and Samar. (2018).**

Egg aging is stopped by the freezing procedure, Enabling women to consider delaying pregnancy. Originally, EF was only provided to women who faced the possibility of infertility as a result of medical issues. including premature ovarian failure or medical treatments like chemotherapy (referred to as "medical" EF). But more lately, EF (also known as "non-medical" EF) has emerged as a choice for women facing the possibility of age-related infertility. For most women who use non-medical the main reason stated by EF for their choice to freeze their eggs is the absence of a suitable spouse for having children. **Baldwin et al. (2019).**

In 1986, Chen made a public declaration about the first triumph of a human in vitro fertilization operation, resulting in the birth of twins. Previously, EF was mostly provided at fertility clinics to women who had been diagnosed with cancer and had experienced reproductive impairment as a result of radiation treatments or chemotherapy. Nevertheless, current patterns prompt infertility clinics to provide elective egg freezing as a means to accommodate women who are not yet prepared to have children but want to save their reproductive capacity by delaying childbirth. **Bavan, et al. (2019).**

In 2018, the Ethics Committee of the American Society for Reproductive Medicine (ASRM) declared that elective egg freezing (EF) is a medically justified treatment that is ethically permissible. Its only objective is to preserve the reproductive capacity of women who are in good health. A woman has to freeze at least 10 oocytes to have a chance of giving birth alive of greater than 50% by the age of 35. This number rises to 40 oocytes at age 40. **Daniluk, et al, (2019).**

According to the practice guidelines of the ASRM and the Society for Assisted Reproductive Technology (SART), the estimated survival rate of oocytes following Vitrification and thawing is from 90% to 97%. The fertilization rate is estimated to be between 71% and 79%, while the implantation rate ranges from 17% to 41%. The clinical pregnancy rate for each oocyte that has undergone vitrification and thawing ranges from 4.5% to 12%. The efficacy of oocyte cryopreservation is impacted by many variables, including costs, cultural norms and attitudes, synchronization delays, and the woman's age at the time of oocyte freezing. Women who are less than 35 years old have the most favorable outcomes. Several objections to age-related egg freezing are disguised as genuine worries about the risks associated with this reproductive technique, such as unforeseen consequences. **De Groot, et al. (2020).**

Significance of the study:

Even among healthcare professionals, knowledge about elective egg freezing differs greatly. In a study of 410 Israeli undergraduate students, students overestimate the likelihood that women will become pregnant on their own at any age. Only

11% of students were aware that genetic pregnancy is unlikely to occur after the middle of their forties. **Greenwood, et al, (2019).**

In a separate research done in Northern California including 328 university students, almost 79% of the students indicated a desire to acquire knowledge regarding the condition of their ovarian reserve at present. Postgraduate students are at a time in their lives when they contemplate their future and their career ambitions. These students are being offered the option of EF, which might impact their choices about their lives and jobs since optional EF technologies are now more visible and feasible. **Harzif, et al , (2020).**

Moreover, the vast majority of women who want to have children express that their doctor is their preferred and most reliable source of information about reproductive health, in contrast to other sources such as the media, peers, and the internet. **Hashiloni-Dolev, et al, (2020).**

However, women generally postpone asking their doctors for advice on conception and fertility until they are older, at a time when their fertility may already be deteriorating or damaged. Additionally, not all medical professionals are knowledgeable about or at ease discussing age-related reproductive decrease with their patients. **Ikhena-Abel, et al. (2019).**

On the other hand, no analogous egg-freezing research has been conducted at Kafr El Sheikh University. Based on the aforementioned, it was discovered that nurses were crucial in female students ' education regarding fertility preservation. So the current study aimed to evaluate the effect of an instructional program on female students' egg-freezing knowledge, attitude, and challenges

Aim of the study:

To evaluate the effect of an instructional program on female students' knowledge, attitude, and challenges towards egg-freezing through:

1- Determine female students' knowledge and attitude regarding egg-freezing
2- Recognize challenges regarding egg freezing
3- Developing and implementing instructional programs according to female students' needs.
4- Evaluating the effect of instructional programs for female students had the greatest impact on improved knowledge and attitude, and there was a notable reduction in the challenges facing egg-freezing

Research Hypothesis:

Implementing the instructional program on egg freezing will lead to enhanced knowledge, attitude, and ability to reduce the challenges facing female students.

Subjects and Method:

Methodology

Study design: A quasi-experimental design was used to achieve the aim of the current study.

Study setting: The study was conducted in the Faculty of Nursing at Kafr El-Sheikh University. Egypt.

Sample Subjects: A convenience sample consisting of 200 female students from the 1st, 2nd, 3rd, and 4th academic grades of the female faculty students who agreed to participate in the program**.**

Inclusion and Exclusion Criteria:

1. Male nursing students were excluded from the study.
2. Female students who register for any instructional program on egg freezing.

Data collecting tools: data was gathered using a set of three tools:

The researchers developed a well-constructed questionnaire for the structured interview. The questionnaire was translated into Arabic to exclude any ambiguous terms related to egg freezing. The translation process the first tools consisted of two parts :

Part I: to assess female student demographic data such as age, academic years, residence, and parent education level.

Part II: assessment of female students' knowledge regarding egg freezing, age for freezing, the lifespan of frozen eggs, indications for the procedure, the desired number of eggs for freezing, variables influencing the success of egg freezing, benefits and potential difficulties, and various techniques of egg freezing**.**

Scoring system: The answers to these questions were scored as "2" for the correct answers, "1" for the incomplete answer, and "0" for the wrong or I don‘t know the answer. The score of each item was stumped up and then converted into a percent score.

Poor knowledge > 50%

Average 50-70%

Good knowledge <70%.

Tools II: The female student's attitude related to egg freezing, such as the misuse or improper storage of frozen eggs, long-term storage, and infection control measures. They emphasize the need for healthcare providers to have a thorough understanding of egg freezing and the need for proper follow-up in the freezing and storage process. Egg-frozen banks must get accreditation and adhere to established requirements.

Attitude scoring system: Each sentence was scored 1 for the correct agree answer and zero for the disagree answer. The attitude was considered to be positive if the percent score was 70% or more and considered negative if less than 70%.

Tool III: Challenges Assessment Tool (pre/post) The researcher designed an Arabic self-administered questionnaire, which was informed by current relevant literature **(Fahmy & Mohamed, 2020)**. The tools consisted of 14 questions, each offering two response options: agree or disagree. The purpose of the assessment was to evaluate the challenges faced by the subject in the process of ova cryopreservation. Inadequate comprehension about ova cryopreservation, During

adolescence, it might be difficult to make decisions about oocyte cryopreservation owing to religious constraints. In Egypt, the practice of ova cryopreservation is prohibited. The factors that might influence the decision to freeze one's eggs include the size of the eggs, the potential for future fertility, age, daily schedule, and job, spousal consent, cultural customs, societal obstacles, financial implications, cultural background, women's age, and the risk of egg mixing with those from another woman.

Scoring system:

The tools consist of 14 items, each with two answer options: agree or disagree. These statements represent the challenges that are encountered in the process of egg freezing

The optimal responses for 10 statements are marked as "disagree" and receive a score of 1 for the correct answer. These statements are numbered 1, 4, 5, 6, 7, 8, 10, 12, 13, and 14. There are only 4 statements marked as "agree" which also receive a score of 1 for the correct answer. These statements are numbered 2, 3, 9, and 11. To achieve a satisfactory response, the total score must be equal to or greater than 60% (8.5 or more), while an unsatisfactory response would have a score of less than 8.5.

Ethical considerations: Official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee, in the Faculty of Nursing in Kafr El Sheikh University. Subjects were given complete full information about the study and their role before signing the informed consent. They were assured that participation was voluntary and they could withdraw at any time. The participants were given assurance of the confidentiality of the information, ensuring that it would not be accessed by any other entity without their permission. Respect was given to ethics, values, culture, and beliefs.

Pilot study: A pilot study was undertaken to assess the clarity, applicability, and understandability of the instrument. It has been conducted on a sample of 10% (20) female students. The pilot participants were included in the main study sample since no major changes were required.

Tools Reliability: The study instrument's ratability coefficient was determined using Cronbach's Alpha. The findings were 0.76 for knowledge, 0.89 for attitude, and 0.85 for the challenges evaluation tool.

Fieldwork: Following the acquisition of formal approvals to conduct the research, the chosen participants were provided with a clear explanation of the study's objective. The research was conducted over 6 months, commencing in January 2020 and concluding in June 2020. average, it took participants approximately 30 minutes to complete the tools. Researchers visited the setting on Saturdays and Thursdays from 10:00 a.m. to 2:00 p.m.

Instructional program: it included 4 phases:

Assessment: This phase included conducting interviews with female students who were present at the faculty of nursing for weekly theoretical lectures at the institution. This stage served as the fourth step in gathering baseline data. At the start of the interview, the researchers cordially addressed the female students and proceeded to introduce themselves to each participant included in the study. That was based on baseline data collected through pre-instruction program evaluation and reviewing of current and previous, local and worldwide relevant literature on various areas of challenges affecting female students was done utilizing textbooks, articles, and monthly

Phase II: planning phase: Developing the instructional program according to the **general objective**

Implementing the instructional program on egg freezing will lead to enhanced knowledge, attitude, and ability to reduce the challenges facing female students.

Content of instructional program: The program's aims and the needs of the study subjects were taken into consideration while choosing the program's content, which includes text covering the concept of egg freezing, the appropriate age for preserving fertility, the reasons for undergoing the procedure, the desired quantity of eggs to be frozen, the variables that may impact the success of egg freezing, the benefits and potential risks associated with the procedure, and the many techniques used for freezing eggs. The eggs were improperly frozen and stored, leading to potential infection risks. Healthcare providers must have a thorough understanding of proper egg-freezing techniques, storage protocols, and infection control measures. Egg-frozen banks should be recognized and adhere to established requirements.

Part Theoretical (8 Sessions):

First session: This session covers the concept of live span freezing, the appropriate age for freezing, the indications for freezing, and the desired quantity of eggs to be frozen.

Sessions 2 and 3 will cover the indications for egg freezing, the desired quantity of eggs to be frozen, the elements that might influence the success of egg freezing, as well as the benefits and potential difficulties associated with the procedure**.**

Sessions 4 and 5 will cover topics such as mishandling and improper storage of frozen eggs, as well as long-term storage and infection control measures**.**

Session 6 will emphasize the significance of healthcare providers having information about frozen eggs, and the need to follow proper procedures for freezing and preserving them. Egg-frozen banks should be recognized and adhere to certain requirements.

Session 7: methods of egg freezing, The eggs were improperly frozen, resulting in lost usage and poor storage conditions. The prolonged

storage and lack of infection control are concerning.

Session 8: Techniques for cryopreservation of eggs. The eggs were improperly stored, resulting in freezing, which led to their deterioration. The prolonged storage and lack of proper infection control further contributed to the issue**.**

Teaching strategies and tools:

A variety of teaching techniques were used, including lectures, group projects, discussions, case studies, videos, posters, and simulations of real-world situations. Educational methods

Implementation: The instructional program was executed over 6 months, consisting of 8 sessions. Each session lasted between 20 and 30 minutes. The instructional program was administered either on an individual basis or in small groups consisting of 2 to 4 female students at the commencement of each session, the researchers started with a recapitulation of the content covered in the preceding session, while ensuring the use of uncomplicated and lucid language to cater to the educational proficiency of the female students. Following the completion of each session, the examined sample was provided with information on the content and schedule of the subsequent session.

Phase V: The evaluation of the instructional program took place one month following its implementation, as part of the follow-up process. The evaluation used the same pre-program framework.

III- Administrative Item: Approval to carry out this study was obtained from the dean of the Faculty of Nursing and all female students participating in conducting the study were explained to them to get their consent and cooperation.

IV-Statistical Item: Upon completion of data collection, data was computed and analyzed using Statistical Package for the Social Science (SPSS), version 27 for analysis. The P value was less than 0.05. Descriptive statistics tests as numbers, percentages, and mean standard deviation (SD), were used to describe the results. Appropriate inferential statistics such as t-test was used. Results, the collected data was organized, analyzed, and tabulated.

Results:

Figure (1): Display the distribution of female students in their academic year. According to the findings of the study, 40.0% of the female students were in their second year. Additionally, 25.0% of them were in their fourth year. Meanwhile, 20.0% of them were in their first year. In addition, 15.0% of them were in their third year.

Figure (2): Reveals that there were statistically significant improvements in female students' total levels of knowledge scores regarding egg freezing at the post-instructional program, compared to pre-program in all knowledge items at $p \leq 0.001$.

Figure (3): Reveals that there was a statistically significant improvement in female students' attitudes regarding egg freezing after the instructional program,

compared to before the program. This change was seen in all item attitudes, with a significance level of p≤0.00

Table (1): shows that there were statistically significant improvements in female students' egg-freezing challenges application at the post-instructional program, compared to the pre-program at p≤0.001

Table (2) shows the total number of female student's challenges with egg freezing application The study revealed that 40.0% of female students' satisfactory response pre-program improved to 85.0 % after the program, and there was a statistically significant improvement in the total mean challenges score, which increased from 7.43 ± 1.91 to 12.34 ± 1.15.

Table (3): Explored the relation between female students' total knowledge and their demographic data. The results indicated a statistically significant relation between the total knowledge of female students and their demographic data such as age, academic year, and parental education level, This relation was seen both before and after the implementation of the instructional program (P < 0.001). There was no statistically significant relation between their place of living before and after the implementation of the instructional program (P > 0.05).

Table (4): Explored the relation between female students' total attitude and their demographic data. The results indicated a statistically significant relation between the total attitude of female students and their demographic data such as age, academic year, and parental education level, This relation was seen both before and after the implementation of the instructional program (P < 0.001). There was no statistically significant relation between their place of living before and after the implementation of the instructional program (P > 0.05)

Table (5): Explored the relation between female students' total challenges and their demographic data. The results indicated a statistically significant relation between the total challenges of female students and their demographic data such as age, academic year, and parental education level, This relation was seen both before and after the implementation of the instructional program (P < 0.001). There was no statistically significant relation between their place of living before and after the implementation of the instructional program (P > 0.05).

Table (6): illustrated that there was a highly statistically significant difference between the mean scores of knowledge, attitude score levels, and total challenges of eggs frozen application at pre and post-implementation of instructional program p < 0.001**.**

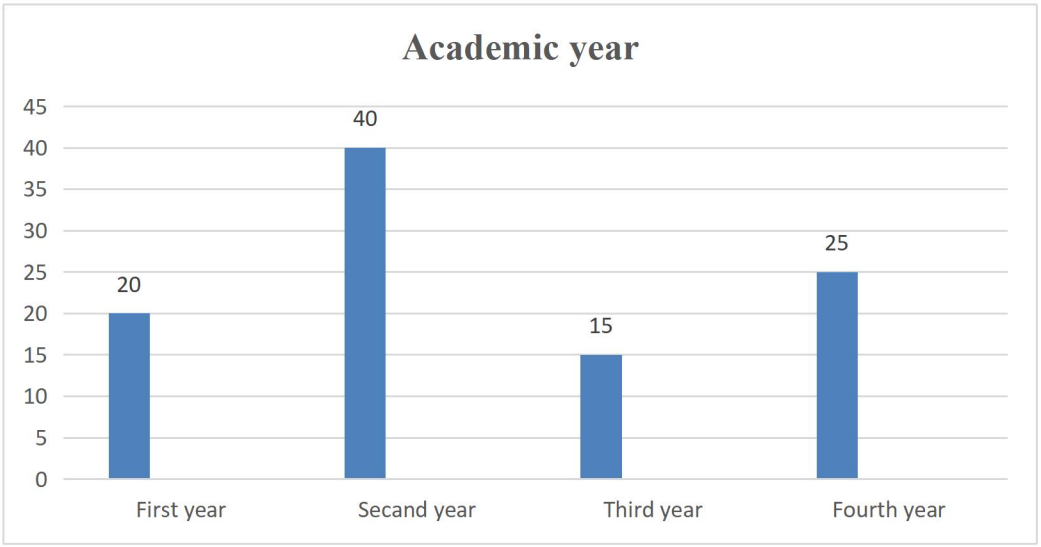

Figure (1): percentage distribution of female students regarding academic years. (n=200).

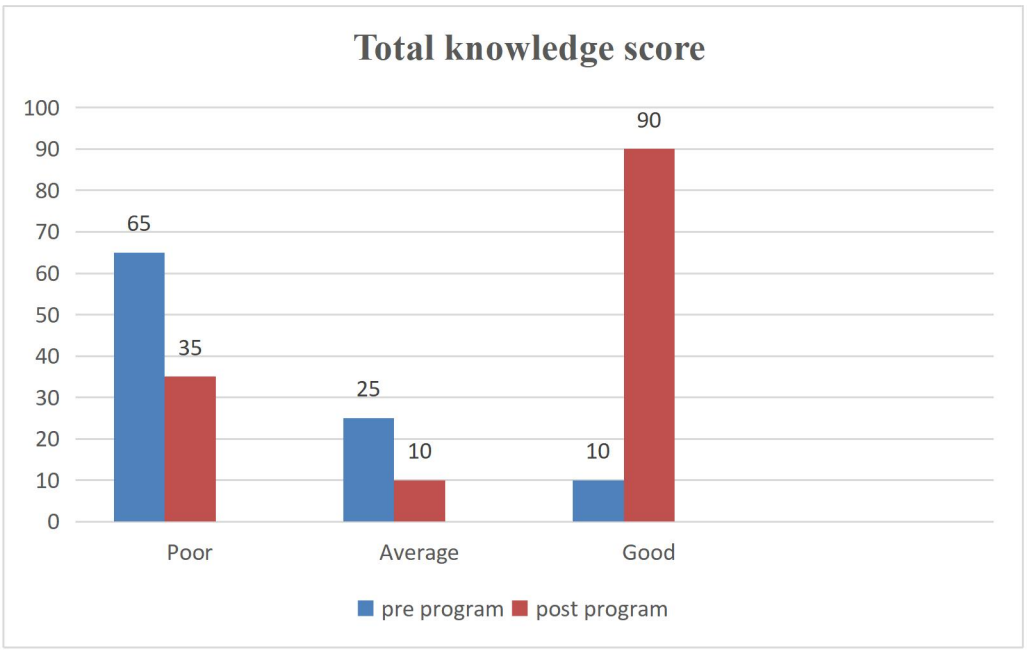

Figure (2): Distribution of female students' total knowledge scores pre and post-educational program about egg freezing (n=200).

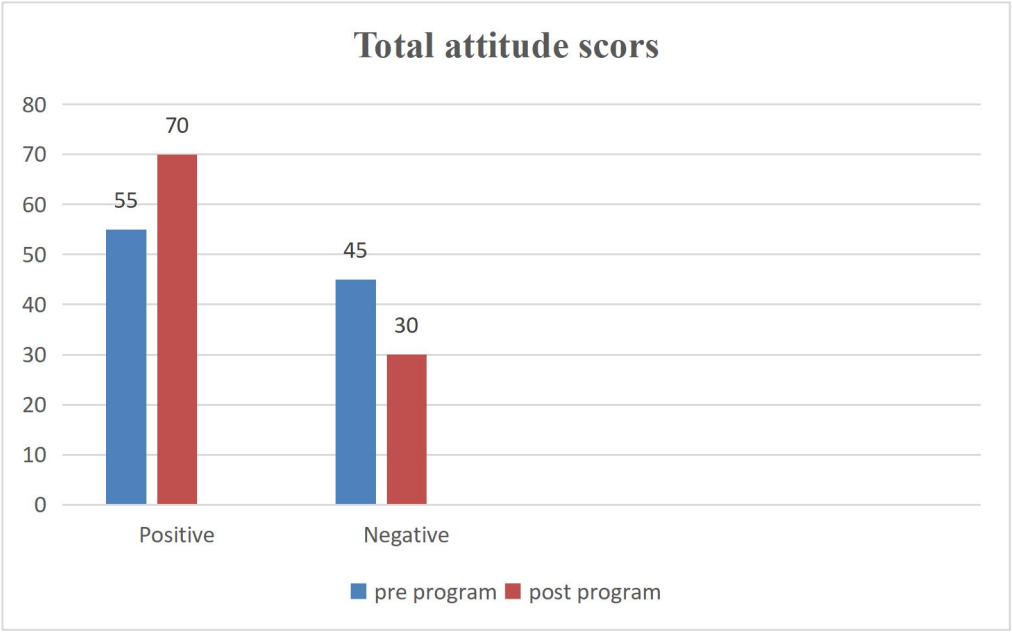

Figure (3): frequency distribution of female students according to total attitude score about egg freezing (n=200)

Table (1): Frequency distribution of female students according to **challenges** of eggs frozen application at pre and post-instructional programs. (n= 200).

Items	Pre-program				Post-program				X 2	p-value
	Agree		disagree		Agree		disagree			
	No	%	No	%	No	%	No	%		
Women may avoid storing their eggs for fear of rejection by a future partner.	150	75.0	50	25.0	70	35.0	130	65.0	21.86	000**
Adolescents may struggle to decide whether to freeze eggs.	155	77.5	45	22.5	65	32.5	135	67.5	23.67	000**
Religious is considered a barrier to egg-freezing	170	85.0	30	15.0	60	30.0	140	70.0	20.95	000**
Egg freezing does not apply in Egypt	120	60.0	80	40.0	30	15.0	170	85.0	21.44	000**
Egg freezing is too pricey for anybody.	145	72.5	55	27.5	20	10.0	180	90.0	23.21	000**
Eggs are the largest cells in the human body which makes freezing and thawing quite difficult.	125	62.5	75	37.5	25	12.5	175	87.5	22.75	000**
Egg freezing decreases future fertility.	80	40.0	120	60.0	10	5.0	190	95.0	24.55	000**
Egg freezing is hindered by age 50.	150	75.0	50	25.0	180	90.0	20	10.0	23.37	000**
Egg freezing influences daily habits	90	45.0	110	55.0	20	10.0	180	90.0	20.53	000**

and working activity.										
Egg freezing should be used with the consent of the husband	120	60.0	80	40.0	15	7.5	185	92.5	21.98	000**
Egg freezing causes virginity loss in unmarried women.	105	52.5	95	47.5	20	10.0	180	90.0	23.45	000**
Egg freezing makes women more prone to moral criticism.	150	75.0	50	25.0	180	90.0	20	10.0	21.22	000**
. Eggs from different women may mingle.	105	52.5	95	47.5	17	8.5	183	91.5	22.93	000**

(**) highly statistically significant at p<0.001

Table (2): frequency distribution of female students according to total **challenges regarding egg freezing application** at pre and post-implementation of instructional program (n=200).

Level of total barriers	**Pre-program**		**Post-program**		**X 2**	**p-value**
	no	%	no	%		
Satisfactory response	80	40.0	170	85.0	25.86	000**
Unsatisfactory response	120	60.0	30	15.0		
Mean ± SD	7.43 ± 1.91		12.34 ±1.15		t=18.85	000**

**highly significant at p ‹ 0.001.

Table (3): Relationship between the demographic data of the female students and their **total knowledge** regarding egg freezing at pre and post-implementation of instructional program (n=200)

Demographic Characteristics	Total knowledge Pre-program						X 2	p-value	Total knowledge Post-program						X 2	p-value
	Poor =130		Average =50		Good =20				Poor =20		Average =20		Good =160			
	no	%	no	%	no	%			no	%	no	%	no	%		
Age																
18-19	25	19.3	13	26.0	2	10.0	10.61	0.34*	5	25.0	6	30.0	29	18.2	9.654	0.44*
20-21	60	46.1	15	30.0	5	25.0			7	35.0	7	35.0	66	41.2		
>21	45	34.6	22	44.0	13	65.0			8	40.0	7	35.0	65	40.6		
Academic years																
First years	20	15.3	15	30.0	5	25.0	7.72	0.46*	5	25.0	4	20.0	31	19.3	10.89	0.23*
Second years	60	46.3	15	30.0	5	25.0			5	25.0	8	40.0	67	41.8		
Third years	15	11.5	13	26.0	2	10.0			3	15.0	6	30.0	21	13.3		
Fourth years	35	26.		14.	8	40.			7	35.0	2	10.0	41	25.6		

		9	7	0		0									
Residence															
Urban Rural	120 10	92.4 7.6	20 30	40.0 60.0	10 10	50.0 50.0	1.80	0.25*	8 12	40.0 60.0	9 11	45.0 55.0	133 27	83.1 16.9	1.12	0.32
Parent education level															
Illiterate	25	19.3	13	26.0	2	10.0	12.90	0.23*	8	40.0	6	30.0	26	16.2	14.96	0.00**
Primary education	40	30.7	15	30.0	5	25.0			6	30.0	6	30.0	48	30.0		
Secondary education	55	42.4	20	40.0	5	25.0			4	20.0	7	35.0	69	43,2		
University education or more	10	7.6	2	4.0	8	40.0			2	10.0	1	5.0	17	10.6		

Table (4): Relationship between the demographic data of the female students and their **total attitude** regarding egg freezing at pre and post-implementation of instructional program (n=200)

Demographic Characteristics	**Total attitude Pre-program**				**X 2**	**p-value**	**Total attitude Post-program**				**X 2**	**p-value**
	Positive = 110		Negative =90				Positive = 140		Negative =60			
	no	%	no	%			no	%	N0	%		
Age												
18-19 20-21 >21	80 20 10	72.7 18.2 9.1	50 30 10	55.5 33.3 11,2	11.82	0.45*	100 30 10	71.4 21.4 7.2	30 20 10	50.0 33.3 16.6	10.823	0.54*
Academic years												
First years Second years Third years Fourth years	30 45 20 15	27.3 40.9 18.2 13.6	10 35 10 35	11.2 38.8 11.2 38.8	8.72	0.49*	35 60 25 20	25.0 42.8 17.9 14.3	5 20 5 30	8.4 33.4 8.3 50.0	10.89	0.23*
Residence												
Urban Rural	80 30	72.8 27.2	70 20	77.7 22.3	2.87	0.35*	100 40	71.4 28.6	50 10	83.3 16.7	1.23	0.42
Parent education level												
Illiterate	15	13.6	25	27.7	13.88	0.26*	30	21.5	10	16.7	15.98	0.00**
Primary education	40	36.3	20	22.2			40	28.5	20	33.3		
Secondary education	45	40.9	35	38.8			65	46.5	15	25.0		
University education or more	10	9.2	10	11.3			5	3.5	15	25.0		

. **highly significant at p ‹ 0.001

Table (5): Relationship between demographic characteristics of the female students and their **challenges** regarding egg freezing application at pre and post-implementation of educational program (n=200)

Demographic Characteristics	Total challenges Pre-program				X 2	p-value	Total challenges Post-program				X 2
	Satisfactory response = 80		Unsatisfactory response =120				Satisfactory response =170		Unsatisfactory response=30		
	no	%	no	%			no	%	N0	%	
Age											
18-19	40	50.0	90	75.0			115	67.6	15	50.0	
20-21	30	37.5	20	16.6	9.74	0.45*	40	23.5	10	33.3	9.44
>21	10	12.5	10	8.4			15	8.9	5	16.7	
Academic years											
First years	15	18.7	25	20.8			35	20.5	5	16.7	
Second years	30	37.6	50	41.6	10.62	0.49*	75	44.3	5	16.7	11.3
Third years	15	18.7	15	12.6			20	11.7	10	33.3	
Fourth years	20	25.0	30	25.0			40	23.5	10	33.3	
Residence											
Urban	60	75.0	90	75.0	3.65	0.45*	130	76.5	20	66.6	2.57
Rural	20	25.0	30	25.0			40	23.5	10	33.4	
Parent education level											
Illiterate	10	12.5	30	25.0			30	17.6	10	33.3	
Primary education	20	25.0	40	33.3			55	32.4	5	16.7	
Secondary education	40	50.0	40	33.3	14.58	0.56*	70	41.2	10	33.3	15.4
University education or more	10	12.5	10	8.5			15	8.8	5	16.7	

**highly significant at p ‹ 0.001

Table (6): Correlation between total knowledge, the attitude of the female students, and their challenges of eggs frozen at pre and post-implementation of instructional program (n=200)

Item	Female students' total knowledge			
	Pre-program		Post-program	
	r	P value	R	P value
Total attitude	**- 0.197**	**0.03**	**- 0.173**	**0.058**
Total challenges	**- 0.028**	**0.763**	**0.353**	**0.000***

(*) statistically significant & (**) high statistically significant P≤0.001

Discussion:

Ovarian cryopreservation (OC) is an assisted reproductive technology (ART) technique that preserves the ability to conceive at a later stage in life. Initially, this technique was only used for medical purposes when a woman faced a medical condition or required a treatment, such as chemotherapy or radiation therapy, that may potentially compromise her fertility. Over the last decade, OC has become more significant as a means of maintaining fertility for non-medical reasons. These terms are often used to describe the practice of storing eggs for social reasons, without a medical need, as a planned procedure known as oocyte cryopreservation. **Tozzo, et al. (2019).**

Regarding female student demographic characteristics, the current study revealed that about two-fifths of them were in their second years, Additionally, a fifth of them were in their fourth year. Meanwhile, a quarter of them were in their first year. Furthermore, a quarter of them were in their third year. This result agrees with **Inhorn, et al (2018).** Who study "Elective egg freezing and its underlying socio-demography: A binational analysis with global implications. Reproductive Biology and Endocrinology"." revealed that 40.0 % of the studied female students were in their second year. Also, 25.0% of them were in the fourth year. While 20.0% of them were in the first year. Moreover, 15.0% of them were in the third year.

According to the research Hypothesis:

Implementing the instructional program on egg freezing will lead to enhanced **knowledge,** attitude, and ability to reduce the challenges facing female students.

Current study results revealed that the female students had incomplete answers about the definition of egg freezing, the appropriate age for undergoing the procedure, the potential lifespan of frozen eggs, indications for egg freezing, the recommended number of eggs to be frozen, variables that may impact the success of egg freezing, the benefits and potential risks associated with the procedure, as well as the many techniques used for egg freezing. There were statistically significant improvements in female students' levels of knowledge scores regarding egg freezing at the post-instructional program, compared to the pre-program in all knowledge items at $p < 0.001$. This result agrees with this. **Johnston, et al (2020).** Who study "Cracked Open: Exploring Attitudes on Access to Egg Freezing. Sexual and Reproductive Health Matters." revealed that the current study had incomplete answers about egg freezing information including its definition, the correct age for the procedure, the lifespan of frozen eggs, indications, the recommended number of eggs to be frozen, variables that may affect the procedure's success, benefits, risks, and many methods., advantages and complications and methods of egg freezing. pre-program implementation improved post-program. There was a statistically significant difference between before and after program implementation complete knowledge regarding egg freeze. From the investigator's point of view, most of the

students had little knowledge about egg freezing because it is not taught in the college curriculum, and most of the students did not receive any workshops or educational programs about egg freezing, but there were differences in the knowledge of the female's students before and after participating in the program

Regarding female students' total knowledge, the current study revealed that more than two-thirds of them have poor knowledge pre-program, while, a quarter of them have average knowledge pre-program. and the minority of them have good knowledge of pre-programs. Improved to the majority of them had good knowledge post-program, one-third of them had poor knowledge post-program, and the minority of them had average knowledge post-program. There were statistically significant improvements in female students' total levels of knowledge scores regarding egg freezing at the post--post-instructional program, compared to the pre-program in all knowledge items at $p \leq 0.001$. This result agrees with this. **Lundsberg, et al (2019).** Who study" Knowledge, attitudes, and practices regarding conception and fertility: A population-based survey among reproductive-age United States women. Fertility and Sterility," revealed that 70.0% of them had poor knowledge pre-program, Whereas, 25.0% of the average knowledge pre-program. and 10.0% of them have good knowledge of pre-program. Improved to 90.0% of them with good knowledge post-program, 30.0% of them with poor knowledge post-program, and 10.0% of them with average knowledge post-program. There were statistically significant improvements in female students' total levels of knowledge scores regarding egg freezing at the post--post-instructional program, compared to the pre-program in all knowledge items at $p \leq 0.001$. From the investigator's point of view, most of the female students participating in the program have a significant improvement in their knowledge after participating in the program.

According to the research Hypothesis: Implementing the instructional program on egg freezing will lead to enhanced knowledge, **attitude**, and ability to reduce the challenges facing female students.

Regarding female student attitudes regarding egg freezing, the current study found that most female students disagree about missed use, bad storage, and long-term storage of EF, more than two-thirds agreed on the importance of EF knowledge for them as health care providers, and more than half agreed on freezing process follow-up, EF bank accreditation and standard, and infection control precautions. The instructional program led to significant improvements in changing female students' attitudes toward egg freezing, with a significant improvement in attitude scores compared to pre-program levels ($p \leq 0.001$). This result agrees with this. **Mahesan, et al (2019).** Who study "Knowledge and attitudes regarding elective oocyte cryopreservation in undergraduate and medical students" revealed that, 81.7%, 85%, and 60% worry about missing usage, unsatisfactory storage, and long-term EF storage. About 70% believed that EF knowledge is important for

healthcare providers. 55%, 41.7, and 48.3% agreed on freezing procedure follow-up, EF bank certification & and standard, and infection control... Improved 90.0% of frameless students agreed on attitudes after participating in the educational program, there were statistically significant improvements in female students' total levels of knowledge scores regarding egg freezing at the post-educational program, compared to pre-program in all knowledge items at $p \leq 0.001$ From the investigator point of view. most of the students changed their attitudes towards freezing eggs after participating in the training program because most of the students improved their knowledge about the importance of freezing eggs and its importance with the nature of the high age of marriage in Egypt due to the high cost of marriage.

Regarding female students' total attitude level regarding egg freezing, the current study revealed that there were statistically significant improvements in female students' total levels of attitude scores regarding egg freezing at the post-instructional program, compared to pre-program in all attitude items at $p \leq 0.001$. This result agrees with this. **Meissner, et al (2018).** Who studied "Awareness, knowledge, and perceptions of infertility, fertility assessment, and assisted reproductive technologies in the era of oocyte freezing among female and male university students" and revealed that there were statistically significant improvements in female students' total levels of attitude scores regarding egg freezing at the post educational program, compared to pre-program in all attitude items at $p \leq 0.001$. From the investigator's point of view. the majority of female students change their attitude scores regarding egg freezing after participating in the instructional program.

According to the research Hypothesis: Implementing the instructional program on egg freezing will lead to enhanced knowledge, attitude, and ability to reduce the **challenges** facing female students.

Regarding female student's challenges with the application of egg freezing before and after instructional program implementation. The majority of female students disagreed with the challenge of applying egg freezing before the program but improved the agreement after the instructional program. There were statistically significant improvements in female students' challenge about application egg freezing at the post-instructional program, compared to the pre-program in all challenge items at $p \leq 0.001$. This result agrees with **Mesen et al (2019**). Who study "Optimal timing for elective egg freezing" revealed that there was a marked improvement in female students' challenges regarding the application of egg freezing after implementing the instructional program with a highly statistically significant difference at ($p < 0.001$). Also, the current study agrees with **Nagy, et al (2019**). Who studied" Clinical evaluation of the efficiency of an oocyte donation program using egg cryo-banking." and revealed that there was a marked improvement in female students' challenges regarding the application of egg freezing after implementing the instructional program with a highly statistically significant

difference (p< 0.001).From the perspective of the investigator. The majority of students lacked an adequate understanding of egg freezing and the associated challenges related to egg transfer. However, their participation in the program resulted in a noticeable enhancement in their knowledge of these hurdles and effective strategies to address them

Regarding female students' total challenge scores regarding the application of egg freezing at pre and post-implementation of instructional programs. The current study revealed that about two-fifths of the satisfactory response pre-program improved to 85.0% satisfactory response post-instructional programs (p< 0.001). Observation increased the overall mean challenge score from 7.43 ± 1.91 to 12.34 ± 1.15 with a statistically significant difference. This result agrees with **Nasab, et al (2019).** who studied "Physicians' attitudes towards using elective oocyte cryopreservation to accommodate the demands of their career. Journal of Assisted Reproduction and Genetics " and revealed that there was a marked improvement in female students' total challenge regarding the application of egg freezing after implementing the educational program with a highly statistically significant difference at (p< 0.001). As evidence, 45.0% of female students responded well to the egg-freezing challenge before the instructional program. After the educational program, the majority was 90.0%. Observation increased the overall mean challenge score from 7.88 ± 1.65 to 11.22 ± 1.33 with a statistically significant difference. From the investigator's point of view, most female students have satisfactory responses to challenges regarding the application of egg freezing due to participating in the educational program that led to improved knowledge, attitude, and challenge towards the application of egg freezing.

Concerned the relationship between students' total knowledge and their demographic data. The results indicated a statistically significant relation between the total knowledge of female students and their demographic data such as age, academic year, and parental education level, This relation was seen both before and after the implementation of the instructional program (P < 0.001). There was no statistically significant relation between their place of living before and after the implementation of the instructional program (P > 0.05). This result agrees with **Nasab, et al (2020**). Who studied "Elective egg freezing: What is the vision of women around the globe?" and revealed that A substantial correlation exists between female students' awareness of egg freezing and socio-demographic factors such as age, academic year, and parent's education level before and after the educational program (P= < 0.001). Pre- and post-educational program residence did not significantly affect (P= > 0.05). From the investigator's point of view, the more education parents have, the more knowledge and interest female students have about egg freezing.

Concerned the relationship between female students' total attitude and their demographic data. The results indicated a statistically significant relation

between the total attitude of female students and their demographic data such as age, academic year, and parental education level, This relation was seen both before and after the implementation of the instructional program ($P < 0.001$). There was no statistically significant relation between their place of living before and after the implementation of the instructional program ($P > 0.05$). This result agrees with **Petropanagos, et al. (2018).** Who study" Social egg freezing: Risk, benefits and other considerations" revealed that A substantial correlation exists between female students' awareness of egg freezing and socio-demographic factors such as age, academic year, and parent's education level before and after the educational program ($P= < 0.001$). Pre- and post-educational program residence did not significantly affect ($P= > 0.05$). From the investigator's point of view, the more education parents have, the more attitude and interests female students have about egg-freezing

Concerned with the relationship between female students' total challenges about the application of eggs frozen and their demographic data. The results indicated a statistically significant relation between the total challenges of female students and their demographic data such as age, academic year, and parental education level, This relation was seen both before and after the implementation of the instructional program ($P < 0.001$). There was no statistically significant relation between their place of living before and after the implementation of the instructional program ($P > 0.05$). The current study agrees with **Pritchard et al. (2019).** Who study" Characteristics and circumstances of women in Australia who cryopreserved their oocytes for non-medical indications." revealed that A substantial correlation exists between female students' egg freezing barriers and socio-demographic factors such as age, academic year, and reparent station level before and after the educational program ($P= < 0.001$). The educational program did not affect their residency pre- and post-program ($P= > 0.05$). From the investigator's point of view, after the female students participated in the educational program, their knowledge about dealing with the problems of egg freezing improved, and the education of university parents had a great impact in improving the students' awareness about egg freezing.

Regarding to correlation between total knowledge, the attitude of the female students, and their challenges about the application of eggs frozen pre and post-implementation of an instructional program, the current study revealed that, A substantial change in knowledge, attitude, and challenges of application frozen eggs was seen before and post-instructional program implementation ($p\leq0.001$). The current study agrees with **Stoop, et al (2019).** Who study" A survey on the intentions and attitudes towards oocyte cryopreservation for non-medical reasons among women of reproductive age. Human Reproduction" revealed that the correlation between total knowledge, the attitude of the female students, and their challenges of the application of eggs frozen at pre and post-implementation of the instructional program, the current study revealed

that, Mean scoring of knowledge, attitude, and challenges of application of eggs frozen were significantly different before and post- instructional program implementation ($p \leq 0.001$). From the investigator's point of view, the more knowledge the female students have, the more they tend to deal with the attitude and challenges of the application of egg freezing.

Conclusion:

The current study's results and the validation of the research hypothesis indicate a significant improvement in female students' knowledge, attitude, and ability to reduce the challenges facing female students. This improvement was observed both before and after the implementation of the instructional program, with a high statistical significance pre- and post-instructional program ($p < 0.001$).

Recommendations:

The following suggestions are made in light of the findings of the present study:

1- Encourage female students to participate in the instruction program, workshops, and conferences on infertility issues and egg freezing to keep up with their education.

2- Provide a textbook on egg freezing to improve female student knowledge and skills.

Further research is required to be performed:

- To improve generalizability, the study will be replicated using a larger probability sample from additional locations.
- Premarital counseling couples and mother-child health clinic families have been studied. These studies attempt to improve their understanding of egg freezing and its possible advantages for their future quality of life, while addressing any challenges.

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