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Study Women's Attitude Regarding Oocyte Cryopreservation: Impact of an Educational Program

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Abstract **Background**: Autoimmune diseases like systemic lupus erythematosus and multiple sclerosis increase the risk of infertility and premature ovarian failure in females. Oocyte cryopreservation (OC) is now offered in fertility clinics to women who want to preserve their reproductive potential by postponing childbearing. OC enhances reproductive autonomy, promotes social equity, and allows women additional time to achieve reproductive goals while mitigating risks of aneuploidies and birth defects associated with advanced maternal age. **Aim:** The current study was conducted to evaluate women's attitude regarding oocyte cryopreservation after an educational program implication. **Subjects and Methods:** ***Design***: A quasi-experimental design was used. ***Sample and Settings***: A study from Beni-Suef University on a purposive sample consisted of 334 working females at Beni-Suef University. ***Tools*:** The current investigation was conducted using two data gathering instruments: (I): A structured interviewing questionnaire; (II): Perceptions of oocyte cryopreservation among women. **Results**: The study reveals that 60.2% of working females aged 20-30 are single, 60.5% are single, and 59.3% are rural residents. 48.8% have insufficient income. Post-program implementation, attitudes towards oocyte preservation presented a significant difference, with a mean score of 48.52±4.66, compared to 36.83±4.87 pre-program. The study also found a significant relationship between age, marital status, and educational level, but not post-program. **Conclusion:** Based on the findings of the present study, it can be concluded that after program implementation, the studied female workers at Beni-Suef University attained a positive attitude regarding oocyte cryopreservation. **Recommendations**: Establishing a health educational program for oocyte cryopreservation technology for nursing students.

Keywords: *Study, women's attitude, oocyte cryopreservation, educational program*

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1. Introduction

Females with several diseases such as systemic lupus erythematosus, endometriosis, vasculitis, multiple sclerosis, and so forth also may require gonadotoxic therapy such as cyclophosphamide and thus, similarly, place them at increased risk of infertility and/or premature ovarian failure [1-11].

Initially limited to cancer patients, OC is now offered electively to women delaying childbearing [12,13,14]. Oocyte cryopreservation was first primarily utilized as a medical intervention for women diagnosed with cancer; however, it is now gaining traction as an elective non-medical procedure [15]. Various terminologies are used for non-medical oocyte freezing; one frequently acknowledged is planned oocyte cryopreservation (POC). Some likewise favor the use of FP, "elective or social oocyte cryopreservation," as well as oocyte banking for anticipated gamete exhaustion [16].

Therefore, OC is one of the most important contributions to reproductive medicine because it increases reproductive autonomy and promotes social justice for women [17]. Furthermore, OC may provide women with more time to accomplish their reproductive goals and lower the risk of aneuploidies and birth abnormalities linked to older eggs [18].

The nurses have a significant role in the care and education of females in all health care and maternity issues, as well as increasing awareness about OC and following the rights of females, especially the right to understand their fertility preservation options [19,20,21,22,23]. Medical and nursing staff members are inconsistent in their awareness of fertility issues among females. Consequently, it is essential to instruct females about fertility preservation at an early age. Additionally, females must receive fertility preservation counseling in order to understand their alternatives for maintaining their fertility [24].

2. Aim of the Study

The current study was conducted to evaluate women's attitude regarding oocyte cryopreservation after an educational program implication.

3. Research Hypothesis

Following the implementation of an educational program, females' knowledge regarding oocyte cryopreservation will be improved.

4. Subject and Method

Research design:

Quasi-experimental research design (pre/post-test) was utilized to achieve the aim of the current study.

Subjects and Settings:

A study from Beni-Suef University on a purposive sample consisted of 334 working females at Beni-Suef University.

Tools of data collection:

Tool I: An Arabic-structured interview questionnaire sheet:

The tool consists of closed-ended questions about female socio-demographic characteristics, including age, education, marital status, occupation, residence area, and monthly income.

Tool (II): Females' attitudes regarding oocyte cryopreservation[12,25,26].

The study evaluates females' attitudes towards oocyte cryopreservation (OC), revealing 21 negative and 13 positive items. Concerns include missed use, poor storage, long storage periods, accessibility, affordability, emotional burden, and religious prohibition. OC should be encouraged, included in premarital counseling, and given freedom to choose maternity time. The scoring system is a three-point Likert scale, with scores ranging from 1 to 63. The total attitude score is divided into positive (for scores of ≥75%), neutral (for scores of 50%– <75), and negative (for scores of <50%) categories. OC is socially acceptable but not applicable in society.

Tools Reliability:

The Cronbach's Alpha test was utilized to assess the reliability of the study tool, revealing a total knowledge reliability coefficient of 0.794.

Preparatory phase:

The researcher developed an educational program on oocyte cryopreservation, including an Arabic handbook and brochure, and conducted a pilot study to assess its applicability and efficiency.

Fieldwork

The study developed an educational program on oocyte cryopreservation (OC) using literature review and interactive sessions. The program covered topics like OC meaning, types, indications, suitable age, number of oocytes, advantages, and complications. A pilot study was conducted on 10% of the sample, and the program was implemented at Beni-Suef University faculties. A post-test was conducted to evaluate the program's effect on female attitudes one month after intervention.

Ethical Consideration and Statistical Design

The study, approved by the Beni-Suef Scientific Ethical Committee, ensured anonymity and confidentiality for female participants, and analyzed data using SPSS 22.0, Pearson correlation coefficient, Chi-square tests, and paired sample t-tests.

5. Results

Figure 1 Summarizes the distribution of studied working females' socio-demographic characteristics. It reveals that 60.2% of working females aged 20-30, 60.5% single, and 59.3% of them are rural residents, with 48.8% having insufficient income.

Table 1 summarizes the overall mean score of studied working females' attitude regarding oocyte preservation through program phases. Post-program, attitudes toward oocyte preservation improved significantly (mean score: 48.52±4.66 vs. pre-program: 36.83±4.87; $p<0.05$).

Table 2 presents the relation between studied working females' socio-demographic characteristics and their attitude levels through program phases. Before program implementation, there were significant statistical relations between studied working females' attitude levels and their age, marital status, and educational level. After program implementation, there were significant statistical relations between studied working females' attitude levels and their marital status and marriage delay to complete studies ($p\leq0.05$). It proves that there is a statistically significant relation between studied working females attitude level with their age pre-program but not statistically significant relation post-program. 0.6% of studied working females aged between 20 and 30 years had positive attitude pre-program which improved to 40.1% of them post-program.

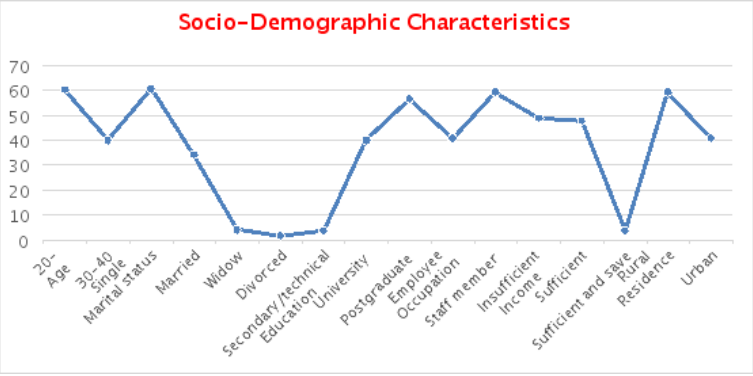

Figure 1. Frequency and percentage distribution of studied working females' socio-demographic characteristics

Table 1. Overall mean score of studied working females' attitude regarding oocyte preservation through program phases (n=334)

Dimensions	Min-Max	Pre Program	Post Program	*t* Value	P-Value
		Mean±SD			
Overall Attitude	21 – 63	36.83±4.87	48.52±4.66	-36.089	0.000**

** Highly statistical difference at P<0.01 t: Paired sample t test

Table 2. Relation between studied working females' socio-demographic characteristics and their attitude levels through program phases (n=334)

Socio-demographics	Pre Program						χ^2	P-value	Post Program						χ^2	P-value
	Positive		Neutral		Negative				Positive		Neutral		Negative			
	No.	%	No.	%	No.	%			No.	%	No.	%	No.	%		
Age (years)																
20 < 30	2	0.6	177	53	22	6.6	7.730	0. 021*	134	40.1	67	20.1	0	0	0.638	0.424
30 < 40	8	2.4	107	32	18	5.4			83	24.9	50	15	0	0		
Marital status																
Single	8	2.4	179	53.6	15	4.5	20.738	0.002**	145	43.4	57	17.1	0	0	13.467	0.004**
Married	1	0.3	89	26.6	24	7.2			59	17.7	55	16.5	0	0		
Widow	0	0	12	3.6	1	0.3			9	2.7	4	1.2	0	0		
Divorced	1	0.3	4	1.2	0	0			4	1.2	1	0.3	0	0		
Educational Level																
Secondary	0	0	11	3.3	1	0.3	11.129	0.025*	7	2.1	5	1.5	0	0	0.272	0.873
University	2	0.6	123	36.8	8	2.4			86	25.7	47	14.1	0	0		
Postgraduate	8	2.4	150	44.9	31	9.3			124	37.1	65	19.5	0	0		
Occupation																
Employee	1	0.3	121	36.2	14	4.2	4.870	0.088	91	27.2	45	13.5	0	0	0.380	0.538
Staff member	9	2.7	163	48.8	26	7.8			126	37.7	72	21.6	0	0		
Monthly Income																
Insufficient	4	1.2	134	40.1	25	7.5	5.468	0.243	110	32.9	53	15.9	0	0	0.986	0.611
Sufficient	5	1.5	139	41.6	15	4.5			100	29.9	59	17.7	0	0		
Sufficient and save	1	0.3	11	3.3	0	0			7	2.1	5	1.5	0	0		
Residence																
Rural	4	1.2	175	42.4	19	5.7	4.484	0.106	137	41	61	18.3	0	0	3.808	0.051
Urban	6	1.8	109	32.6	21	6.3			80	24	56	16.8	0	0		

*Statistical difference at P<0.05 ** Highly statistical difference at P<0.01

6. Discussion

Nurses play a crucial role in the care and education of females, as well as in raising awareness about oocyte cryopreservation and the respect for women's right to understand fertility preservation options [27,28,29,30]. Additionally, besides their counseling and educating role within society, nurses have a greater number of relationships with women and families than other healthcare professionals. In recent years, the results of previous studies have shown that the nursing profession is accountable for the discussion of fertility preservation options from a physician's point of view [31-39].

The results of the current study revealed that the mean overall attitude score of the study sample improved from 36.83±4 pre-program to 48.52±4.66 post-program implementation. Additionally, about two-thirds of the studied females had a positive attitude regarding OC as compared to only three percent pre-program. On the other hand, no one had a negative attitude after the implementation of the program. This finding of the study agrees with Abd El-fattah et al. (2023), who revealed that there was a highly statistically significant improvement in the total behavior of the studied females, as the majority of them had positive behavior immediately after and during the follow-up program implementation, compared to the majority of them having negative behavior pre-program [40].

Thus, the study indicates that program sessions positively influenced working women's attitudes toward OC, leading to improved positive and reduced negative attitude ratings. These changes are linked to lectures, positive reinforcement, and instructional strategies [41,42,43]. Additionally, the use of concise, plain-language Arabic pamphlets enhanced knowledge retention, consistent with Edgar Dale's Pyramid of Learning, which emphasizes the effectiveness of discussions and audiovisual aids in learning retention [44,45,46].

Also, agreed with the study conducted by Mansour & Hassan (2021) entitled "An Educational Package for Oncology Nurses Regarding Fertility Preservation among Female Cancer Patients," they found that there was a highly statistically significant improvement in the total attitude [47].

Moreover, the study's finding was congruent with Nasab et al. (2020), in Houston, USA, who studied "Elective oocyte cryopreservation: what is the vision of women around the globe?" He concluded that more than one half of the responders in their study had a positive attitude regarding oocyte cryopreservation as a potential preservation option [48].

On the contrary, the finding of the current study is unsupported by Sandhu et al. (2023), who assessed "Information and decision support needs: A survey of women interested in receiving planned oocyte cryopreservation information" and showed that the majority of women who considered using OC had high decisional conflict, indicating a need for decision support [18]. The improvement in participants' overall attitudes indicates the significant positive impact of the educational program on their level of awareness.

Relating to the studied working females' socio-demographic characteristics and their attitude levels through program phases, the current study showed that there was a statistically significant relation between the studied females' attitude level and their age and educational level pre-program but not a statistically significant relation post-program. These findings of the study agree with those of studies applied in Egypt by Hasab Allah et al. (2021) and Abd El-fattah et al. (2023); they revealed that there was a significant statistical relation between the studied females' overall attitude regarding EF with their age and educational level [40,49]. In the researcher's perspective, this may be due to highly educated elderly females having more positive attitudes regarding OC than young females.

Also, the study's finding showed a highly significant association between females' overall attitude level and their marital status pre- and post-program implementation. This may be attributed to single females having more positive attitudes toward OC, as they wish to be on the safe side regarding their future fertility. The finding of the study is aligned with Nweze et al. (2024), in their recent study entitled "Oocyte Cryopreservation and its Relationship with Marital Status of Female Lecturers in Enugu State Universities," and indicated that there was a significant association between females' attitudes and their marital status [50].

On the contrary, this finding is incongruent with Johnston et al. (2020), who conducted a study entitled "Cracked open: exploring attitudes on access to egg freezing" in Australia and reported that there was no statistically significant relation between respondents' attitude about cryopreservation and their age, highest level of education, and relationship status [24].

Furthermore, the study's findings indicated that there was not a statistically significant relation between females' attitude toward their occupation and monthly income from their point of view pre- and post-program implementation. This may be attributed to the fact that employed females with sufficient income are more favorable towards new reproductive health options like OC as a part of informed future family planning. This finding is unsupported by Akhondi et al. (2023), who revealed that there was a statistical association between females' beliefs and their occupation and monthly income [51].

Likewise, there was no statistically significant relation between females' attitudes and their residence pre- and post-program implementation. Nevertheless, both rural and urban resident females have positive attitudes post-program compared to pre-program. This finding was in agreement with Fahmy & Mohamed (2021); they mentioned that there was no statistically significant association between nursing females' attitudes and their residence [12]. This may be attributed to the recent increase in the age of marriage in both urban and rural residences, which has led females to develop a more favorable attitude toward OC.

In addition, the study's findings reported a significant statistical relation of females' attitude and delayed marriage to complete their studies or for career reasons pre- and post-program. While there was no statistically significant relation with delayed childbearing pre- and post-program implementation. This finding was in agreement with those studies conducted by Alzharni et al. (2025) and Sayegh et al. (2023); they revealed that there was a statistical association between females' attitude and delayed marriage for work commitment and professional opportunities. In the researcher's perspective, this may be due to the majority of females aiming to balance career advancements and reproductive health before starting a family [52,53].

7. Conclusion

The educational program significantly improved attitudes toward OCamongparticipants, demonstrating its efficacy in fostering reproductive health awareness.

8. Recommendation

Implement health education programs on OC technology for nursing students to broaden its reach.

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