

Impact of Educational Program on the Success Rate of Intracytoplasmic Sperm Injection

Naglaa Shaban El-sharkawy⁽¹⁾, Sanaa Ali Nour Eldin⁽²⁾, Abdulmagid Mahmoud Sarhan⁽³⁾ & Hend salah Eldin Mohammed⁽⁴⁾

⁽¹⁾ Assistant lecturer- Badr University in Cairo , ⁽²⁾ Professor of Obstetrics and Gynecological Nursing - Faculty of Nursing Zagazig University, ⁽³⁾ Professor of Obstetrics and Gynecology- Faculty of Medicine Zagazig University & ⁽⁴⁾ Professor of Obstetrics and Gynecological, Nursing Faculty of Nursing- Zagazig University.

Abstract

Background: Intracytoplasmic sperm injection is an invasive procedure whereby one spermatozoon is injected into the oocyte cytoplasm. Aim of the study: was to assess the impact of an educational program on the success rate for women undergoing ICSI. Subjects and Methods: Research design: descriptive study and a quasi-experimental design was adopted to carry out this study. Setting: The study was conducted at El-Kasr El-Einy assisted reproductive technology and ICSI unit and clinic of the Maternity Hospital Subjects: A purposive sample of 100 couples (wives and husbands) undergoing ICSI who attended the study setting . Tools of data collection:five tools were used. **Tool I:** A structured interviewing questionnaire,**Tool II:** Women's knowledge, and practice pre/post-tests sheet,**Tool III:** Anxiety assessment scale,**Tool IV:** Instructional learning booklet and **Tool V:** Follow up sheet. Results: The study revealed that an educational program is more effective in improving knowledge among the study group rather than the control group. Conclusion: An education program was effective in preparing couples undergoing ICSI to cope with the procedure and its implications.Recommendations: an educational program should be given for infertile couples undergoing ICSI especially for the first trial of starting treatment.

Key words: Intra-cytoplasmic sperm injection, An educational program, Spermatozoon, Assisted reproductive technology.

Introduction

Infertility is the failure to conceive after one year or more with regular unprotected sexual intercourse. Primary infertility is the failure of a couple to have one child. While, secondary infertility is the failure to conceive following a previous pregnancy. ⁽¹⁾ In 2010, approximately about 50 million couples worldwide were unable to have a child and seeking treatment. ⁽²⁾ Infertility is perceived as a problem across virtually all cultures and societies and affects an estimated 10-15% of couples of reproductive ages. World Health Organization has been indicated that 8% to 12% of couples' worldwide experience infertility. ⁽³⁾

The incidence of infertility cannot exactly be estimated in Egypt, but the rates of primary and secondary infertility among infertile couples were estimated to be 70.7 percent and 29.3 percent respectively, according to research. ⁽⁴⁾

Assisted reproductive technology (ART) is an artificial or partially artificial method used to achieve pregnancy. In general, ART procedures involve surgically removing eggs from the ovary of a woman and then combining them with sperm in the laboratory and then returning them to the body of a woman or donating them to another woman ⁽⁵⁾

Assisted Reproductive Technology (ART) generally refers to in vitro fertilization and transfer of embryos (IVF-ET, IVF) and micro-insemination, but it also includes artificial insemination with husband's semen (AIH) in a broad sense. There are several micro insemination techniques available, but the intracytoplasmic sperm injection (ICSI) method with the highest success rate is currently selected and implemented. ⁽⁶⁾

Intracytoplasmic sperm injection (ICSI) is an in vitro fertilization procedure that directly

injects a single sperm into an oocyte. This method is most commonly used to overcome problems of male infertility, although it can also be used where sperm cannot readily penetrate eggs, and occasionally in addition to sperm donation. ⁽⁷⁾ Spermatozoa obtained from ejaculation, microsurgical epididymal sperm aspiration (MESA), percutaneous epididymal sperm aspiration (PESA) or extraction of testicular sperm is possible with ICSI. In addition, idiopathic infertility and repeated conventional IVF failures are indications for ICSI. ⁽⁸⁾

Fertility clinic nurses often need to advise, and support couples in their coping with infertility and treatment-related stress. The nurse is often the first health care provider to meet couples with a period of treatment. It is therefore important to gain insight into the mechanisms that affect the coping response of the patients. ⁽⁹⁾ From both a medical and psychological perspective, maternity nurses can play an integral role in the care of their patients undergoing ART treatment through a counselling process through which individuals and couples are given the opportunity to explore their thoughts, emotions, reactions and beliefs with an impartial and empathic professional who understands the issues involved.

Good counselling helps couples better cope. Usually, it brings more clarity, a wider perspective and some peace of mind. Decisions are made more clearly about what choices to make and are based on realism and self-knowledge. The method is entirely confidential. ⁽¹⁰⁾ Before entering the operation room, the nurse should welcome the couple, reassure them, provide emotional support, and give them the necessary instructions in a simple and familiar manner.

The impact of the couple's psychological status is very important

because they suffer from anxiety and fear of treatment failure, neglect of their feelings can lead to increased stress, anxiety, it has a negative impact on the couple's response rate to treatment and the ICSI success rate; this was supported by ICSI's success rate. ⁽¹¹⁾ Palha and Lourenco (2011) were mentioned that anxiety and psychological factors may affect the outcome of infertility treatment. ⁽¹¹⁾

Significance of the study:

Infertility, which affects many couples, is a common problem. Globally, during their reproductive lives, about 8.0 percent of couples experience any form of infertility problems. Most of the population treated with assisted reproductive technologies Eyo et al., ⁽¹²⁾. One of the important techniques for the treatment of infertile couples is intracytoplasmic sperm injection, and recent research has focused on improving embryo transfer techniques in the hope of increasing ICSI success rates. The current study was conducted to evaluate the impact of the education programme on the ICSI success rate.

Aim of the Study:

The aim of the Study was:

To assess the impact of an educational program on the success rate for women undergoing Intracytoplasmic sperm injection.

Research Questions:

- Is the educational program for women undergoing Intracytoplasmic sperm injection increasing the success rate of ICSI?

Research hypothesis:

The educational program will improve the level of knowledge and practices of infertile women undergoing ICSI, their success rate

and decreasing problems that may be encountered among women undergoing ICSI.

Subjects and Methods:

Research design: descriptive study and a quasi-experimental design was adopted to carry out this study.

Study setting:

The study was conducted at El-Kasr El-Aini ART and ICSI unit and clinic of the Maternity Hospital, Cairo University Hospitals

Study Subjects:

Sample:

The sample consisted of 100 infertile couples undergoing ICSI. Such sample was divided into two groups:

- 1) The study group consisted of 50 couples who were received the educational program and followed up until the pregnancy test, then followed up two weeks more until the ultrasound finding proved a positive or negative pregnancy.
- 2) The control group consisted of 50 couples who were received routine care and was contacted after the ICSI treatment cycle.

Target Population:

All infertile couples who were undergoing ICSI and attended the study setting during the time of data collection.

Inclusion criteria:

- Women had the criteria of an ICSI treatment.
- Women age was less than 40.
- Women accepted to participate in the study.

Tool for data collection:

Data collection was done by the following tools:

- **Tool I:** A structured interview questionnaire was designed by the researcher in the Arabic language for the collection of data, after reviewing the related current national and international previous literature. It consisted of two parts as follows: **Part (1)** was used to assess the socio-demographic characteristics of the study groups as: age, residence, educational level, occupation (wife & husband), duration of the marriage, family income, and if any of the couples were previously married and have any children. **Part (2)** was used to assess infertility history for the couple as infertility causes, previous intervention, and its result.
- **Tool II:** Women's knowledge and Practice pre/post-tests sheet was designed by the researcher to assess the level of knowledge and practice for ICSI procedures among the studied groups before and after the intervention.

Scoring system for pre/post-test sheets:

Part (1): It consists of a question about the couple's source of information before the study marked as (1) for "yes" answer and (0) for "no" answer.

Part (2): It consists of twenty questions (true and false questions) marked as (1) for a true answer and (0) for false answer.

Part (3): It consists of twenty-seven open -ended questions marked as (0) for no answer (1) for incomplete correct answer and (2) for correct answer.

Part (4): It consists of seven open -ended questions marked as (0) for no answer (1) for incomplete correct answer and (2) for correct answer.

Part (5): It consists of one open ended questions marked as (0) for no answer (1) for correct answer, short essay

questions each correct answer marked (1) and total degree is five.

Scoring system:

The scores of the items were summed- up and total divided by the number of the items, giving a mean and standard deviation were computed. Score for each part were converted into percentage and knowledge considered unsatisfactory less than 60% and satisfactory at 60% or more.

Tool III: Anxiety assessment scale, the original sheet was designed by Fraster and Cooper⁽¹³⁾. The scale was modified by the researcher to assess the anxiety level for the couple (wife & husband) before the procedure. Some items were excluded to be applicable to the current study. The new scale included 40 signs and symptoms of stress. This scale is divided into 3 parts as follows:

Part (1): It is systematically prescribing the physiological stressors of each body's systems of the infertile couple undergoing ICSI as cardiovascular, respiratory, gastrointestinal, and urinary system stress symptoms.

Part (2): It was used to assess psychological stressors facing the infertile couple undergoing ICSI as loss of interest, nightmares, worries, and fears, etc.

Part (3): It was used to assess the socioeconomic stressors which affect the infertile couple undergoing ICSI as economic consequences of the infertile couple and medication costs.

Scoring system of the anxiety assessment sheet:

The sheet consisted of 41 items for stress response. When they were subjected to the stress item and absent when they were not subjected to it each item reflecting the presence of stress was given one point. The couple was scored as a present. The rating system was as follows: The couple was graded as having low stressors with a cumulative score of 0-15. A composite score of 16-30 was rated by the couple as having

moderate stressors. The pair had a combined score of 31-41 and was listed as having high stressors.

Tool IV: Instructional learning booklet for the study group about the ICSI treatment cycle included the reproductive biology of male and female organs, menstrual cycle, ovulation, seminal fluid, and conception. In addition to ICSI definition, indication, procedure steps, care pre and after the procedure, methods of sperm retrieval, seminal collection, precautions, methods for collection, important instruction and coping issues for pre-procedure preparation, pre/ post oocytes retrieval, embryo transfer precaution and ICSI complication were designed by the researcher to promote couples' knowledge and practices which helped in elevates success rate. Injection self-administration, its time, types, sites were demonstrated.

Tool V: A follow-up sheet was designed by the researcher to assess women condition after ICSI treatment, success rate, and the outcome of the procedure (the day of embryo transfer, number of fertilized embryo transferred, day of the pregnancy test, the result of the test and any complications happened for the couple) in both groups.

Content validity and reliability:

The tools were tested for content validity by five experts in the field of obstetrics and gynecological nursing. The recommended modifications were done, and the final form was ready for use.

Field work:

Collection of data covered a period of one year "from the first of June 2018 to the end of May 2019". After getting the official permission, the pilot testing of the study tools was done and analyzed. The researcher attended ART and ICSI Clinic and Unit two days (Saturday and Tuesday) per week. She filled the interviewing questionnaire sheet individually, after explaining the purpose of the study.

Each interview took about 5-15 minutes. The researcher collected the data through three phases:

Phase (1) Preparing the intervention methods: (Educational booklet and brochure, PowerPoint presentation of procedures, and posters) all documents were updated by the ART unit director to ensure that their care plan was not objected to or interfered with. The researcher worked with the team of the unit to monitor the source of information and planned communication strategies such as telephone number, call timing, and contacts to collect information about couples that began the treatment period. The researcher mutually randomly distributed the couples as a couple who was received an educational program and a couple who received the routine care of the ICSI cycle, and so on

Phase (2) Implementation for the intervention method: The researcher attended the ART clinic to meet the couple with the physician who informed the couple that the ICSI is the choice for treatment and described the routine of injections and investigation, the researcher interviewed the couple, written approval from the couple was obtained after explaining the purpose of the study. Then, the researcher assessed the couple's knowledge, practices for both wife- husband together by using a pre-test, and stressors for each one by anxiety assessment sheet for both groups. The researcher divided the studied sample into Group (1), 50 couples who were received educational sessions by the researcher and Group (2), 50 couples who were received routine care of ICSI by ART clinic and unit.

Educational session receiving group (study group): At the beginning of the programme, couples offered four educational sessions, at the date of oocyte retrieval and embryo transfer date, the fourth session was at two weeks after

embryo transfer. Each training session typically lasts between 30 and 45 minutes, and it was conducted in a comfortable, quiet, and dedicated time and space. Issues of confidentiality were confirmed.

First session: The researcher discussed with the couple the nature of their problems and answered their questions about infertility, previous, current treatments, and brief reproductive biology. Then, discussed with the couple, the procedure and its steps by using videos for oocyte retrieval and intracytoplasmic sperm injection in the lab, and distributed the instructional learning booklet and brochure for enriching them with knowledge and give chance for next session asking questions and discussed with them medication, types, benefits, precautions and demonstrated with them I.M. and S.C. injection. The researcher discussed with couples their stressors and fears and how to be managed. The researcher gave the couple a follow-up card to record procedure data and any complications occurred during the treatment.

Second session: On the day of retrieval, the researcher met the couple on the morning of the procedure, after greeting them, asking about their condition and explained what will be done in the operating room, and instructed the couple about the collection of seminal specimen, the researcher distributed the anxiety assessment sheet for each wife and husband and after the retrieval, the couple answered the post-test .

Third session: On the day of embryo transfer, the researcher discussed with the couple the care after transferring, and minor discomfort and rest .

Fourth session: Two weeks after embryo transfer for a couple whose conception had failed in the lab, the researcher attended with them when the doctor informed them about the

failure of conception and tried to support them .

Control group: The researcher distributed knowledge and practice pre-test sheets for couples and gave the couple a follow-up card to record procedure data. On the day of retrieval, the researcher met the couple in the morning of the procedure, after greeting them, asking about their condition the researcher distributed the stressor' assessment for each wife and husband and after the retrieval, the couple received the post-test.

Phase (3), evaluating the effectiveness of the intervention method and comparing to the pre and post-intervention results. And follow up.

Pilot study:

The pilot study was conducted on 10% of the total sample to test the content validity, clarity, and applicability of the tools as well as to estimate the time needed for data collection.

Administration and ethical consideration:

Official permission to conduct the study was granted from the pertinent authorities of the study settings. An official letter was sent from Zagazig Faculty of Nursing to the director of El-Kasr El-Aini Maternity Hospital at Cairo University to obtain official approval for the collection of data During all phases of the research, all ethical issues were considered: the researcher maintained the subjects' anonymity and confidentiality. Inclusion in the study was completely voluntary. Enrolled women would have similar needs for emotional support and would require the relevant pushing information. Before participation, the purpose of the study was clarified to every woman and the participant's permission was obtained by written informed consent. Women have been told that they can withdraw at any

point of the study; they have also ensured that the data collected during the study is confidential and used for research purposes only.

Statistical analysis:

After data collection, it was revised, coded, and fed to statistical software IBM SPSS version 20. Using Microsoft Excel software, the given graphs were built. Two-tailed experiments and an alpha error of 0.05 were used to conduct all the statistical analysis. It was found that a p-value less than or equal to 0.05 was statistically important. According to the type of data qualitative represent as number and percentage, quantitative continues group represent by mean \pm SD, the following tests were used to test differences for significance; Difference and association of qualitative variable by Chi square test (X^2). P value was set at <0.05 for significant results & <0.001 for high significant result.

Results:

Table (1): describes the socio-demographic characteristics of infertile couples among the two studied groups; The wives' age in both groups ranged between 27-39 years with a Mean \pm SD 32.28 ± 3.828 in study group, and with a Mean \pm SD 31.60 ± 3.523 in control group. Approximately three fifths (56% & 52% respectively) of wives in both studied groups were housewives and 52% and 48% respectively have basic/intermediate educational level. Regarding to the husbands' age it ranged between 30-49 years in study group with Mean \pm SD 39.28 ± 6.283 and ranged between 28-49 years in control group with a Mean \pm SD of 37.54 ± 6.152 . As for husbands' education, 38% of study group and 42% of control group have university education. More than half (54%) of husbands in study group were worker, while more than half (60%) of husbands were employ in control group. The most of couples in study group were from rural place and

more than half of the couples in control group were from urban and the highest percentages of both groups had insufficient income to cover the treatment costs. The table indicates no statistically significant differences found between the two studied groups.

Table (2): shows the infertility history among couples in the two studied groups. The Mean \pm SD of infertility duration among the couples in the two studied groups were 4.42 ± 2.673 years in study group and 3.80 ± 2.050 years in control group. Regarding to causes of infertility, about half of both groups (58% & 54% respectively) were related to husbands' causes, while wives related causes were less in the two groups (22% & 24% respectively). Sperm deformities among husbands and irregular ovulation among wives represented the highest percentages of study group and 41.4% & 40.8% for oligospermia and 36.4% & 46.7% for irregular ovulation.

Figure (1): reflects sources of couple's information about intracytoplasmic sperm injection among the two studied groups before intervention. Physicians were the main source for the majority of couples (72% & 66% respectively). The rest of couples got their information from nurses, laboratory technicians, media and others' experiences for infertility.

Table (3): summarizes the mean scores of knowledge and practices among the studied groups before and after the intervention. Couples in study group showed improvement in their mean scores from 28.14 ± 3.307 before to 90.02 ± 2.299 after the intervention. Couples in control group showed a mean of 28.50 ± 2.589 before to 73.96 ± 3.084 after the intervention. In comparing the effects of both interventions, the study revealed that study group more effective than control group, mean scores 90.02 ± 2.299 & 73.96 ± 3.084 respectively.

Table (4): summarizes stressors' symptoms among couples' in the studied groups. The couples suffered different types of stressors physiological, psychological, and socio-economical. However, wives suffer from physiological and psychological stressors more than their husbands. Conversely, Husbands suffer from socio-economical stressors (increased costs and concern about failure) more than their wives.

Table (5): represents current treatment's outcome among couples in the two studied groups. In study group 31 couples (62%) had conception in the lab and the pregnancy test was positive for 14 couples, in comparing with control group, 22 couples (44%) had conception in the lab and the pregnancy test was positive for 12 couples.

Table (6): summarizes Satisfaction among couples related to Health educational program in the studied groups. The frequency of satisfied wives after the intervention in study group were 96% vs 84% in control group while the frequency of satisfied husbands after the intervention in study group were 94% vs. 76% in control group with statistically significant differences between the two groups where $P=0.023$.

Discussion:

Infertility is recognised by the American Society for Reproductive Medicine (ASRM) as a result of a male or female reproductive system disorder (interruption, termination or malfunction of systems/organ/body functions), which in turn prevents the conception of a child. Unless prior diagnosis and treatment is determined by medical background, age or physical observations, the period of unprotected intercourse with inability to conceive should be at least 1 year before an infertility test is performed Gamel et al.,⁽¹⁴⁾.

In 1992, an intracytoplasmic sperm injection (ICSI) technique was

developed in order to achieve fertilization by mechanically injecting a single spermatozoon into an oocyte in vitro. While up to 50% of traditional IVF treatments for couples with severe male infertility (moderate oligozoospermia, asthenozoospermia and teratozoospermia) have been reported to have complete fertilization failure, this has occurred in <3% of couples undergoing ICSI. Consequently, ICSI has been used to treat extreme male infertility worldwide Guo et al.,⁽¹⁵⁾

Fertility clinic nurses also need to educate, advise and assist couples in their dealing with infertility- and treatment-related stress. Nurses are also the first health care provider to meet couples with treatment periods. It is therefore important to gain insight into the processes that affect the coping response of the patients Pedro et al.,⁽¹⁶⁾

The aim of our study was to assess the impact of educational program on the success rate for women undergoing Intracytoplasmic sperm injection (ICSI) assess the problems experienced by women undergoing ICSI treatment.

As regarding to our study, the wives' age in both groups ranged between 27-39 years with a Mean \pm SD 32.28 ± 3.828 in study group, and with a Mean \pm SD 31.60 ± 3.523 in control group. This finding is matching with the data of Heredia et al.,⁽¹⁷⁾ who found the age of women was 33.3 ± 4.6 years. Also, it partially agrees with the data of Kissi et al.,⁽¹⁸⁾ who compared measures of psychological distress between men and women undergoing ART in the Unit of Reproductive Medicine in the Department of Obstetrics and Gynecology at "Farhat Hached" Hospital in Sousse, Tunisia, found that the mean age of the women was (32.6 ± 6.9) years old. Conversely, our finding differs from that reported by Humaidan et al.,⁽¹⁹⁾

who found the age of women is < 30 years old.

Regarding socio-demographic data our study is matched with the study of Yakout et al.,⁽²⁰⁾ to study the Emotional problems of Infertile Egyptian women at infertility unit and Out-patient gynaecologic section at El-Kasr El-Aini Hospital Cairo university, with higher percentage of the infertile females aged below 30 years and lower level of high education. Housewives were most of the studied subjects. Nearly two-thirds of the overall subjects were also married below and at the age of 20 years. In terms of marriage length, more than one third of the total subjects were married for less than five years, which is lower than in our sample. Almost three quarters had no children in comparison to the existence of children with infertile mothers, which is similar to our findings. Such similarities between the results of the above-mentioned study and the present one could be attributed to the setting of the study in rural areas with low socio-economic status, low income, low level of education and lower marriage age, especially among women.

In our study, the infertility history among couples in the two studied groups was matched regarding infertility duration. Regarding to the causes of infertility, the causes of husbands were related to around half of the two groups, while the causes associated with wives were lower in the two groups. The highest percentages in the sample population, 41.4 percent & 40.7 percent for oligospermia and 36.4 percent & 46.7 percent for irregular ovulation (22 percent & 24 percent respectively), were sperm deformities among husbands and irregular ovulation among women. These results are explained as most causes of infertility are related to husband's causes and ICSI is the best preferred cause of

male infertility. These findings were agreed by the finding of Gamel et al.,⁽¹⁴⁾ and Yakout et al.,⁽²⁰⁾.

In the study of Gamel et al.,⁽¹⁴⁾ the main causes of male infertility was sperm production problems followed by blockage of sperm transport while hormonal problems present 20.0% of male related infertility and sexual problems (erection and ejaculatory problems) presents 14.0% of causes of infertility.

Regarding female factors, in our study most causes were ovulatory problems (41.4% & 40.7% in both groups), in the study of Youness et al.,⁽²¹⁾ the most common cause of infertility was the ovulatory disorders even among the healthy lifestyle status (75%), the relatively healthy (10%) and the unhealthy lifestyle status (4%), with a highly statistical significant difference among the groups.

In our study, regarding sources of couples information about ICSI among the two studied groups before intervention. Physicians were the main source for the majority of couples and the rest of couples got their information from nurses, laboratory technicians, media and others' experiences for infertility. Conversely, in the study of Talarczyk et al.,⁽²²⁾ they concluded that, the majority of patients used Internet to find information about infertility (93%); 46% of the respondent declared Internet forums to be their main source of information about it.

Regarding the mean cores of knowledge and practices among the studied groups before and after the intervention, Couples in the study group showed improvement in their mean scores from (28.14±3.307 SD) before to (90.02±2.299 SD) after the intervention. There is a statistically significant difference between both groups (<0.001). This proves and explains the role of educational programs regarding reproductive

health and fertility in improving knowledge and practices among the infertile couples.

The current study results were supported by Ramadan et al.,⁽²³⁾ at Benha University Hospital; they concluded that 49.0% of women had poor knowledge before intervention. However, 73.0% of them had good knowledge after one month of intervention respectively. Moreover, there was a highly statistically significant correlation ($P < 0.01$) between the infertile women' sexual function scores pre and post one month of intervention.

Moreover, the results of the present study were also compatible with Farag⁽²⁴⁾, in Egypt, found that counselling program was significantly effective in improving knowledge, attitude and satisfaction of couples and provides psychological support during the procedure.

Regarding stressors' symptoms among wives and Husbands' in the studied groups, the frequency of wives were suffering from stressors after the intervention in study group, the main complaints after the intervention were Tachycardia, dyspnea, nausea and anxiety from fear of the failure of the procedures. Stressors affected wives in control group were sweating; dizziness, anxiety, and increased cost. The frequency of husbands was suffering from stressors after the intervention in study group showed that the main complaints after the intervention were breathlessness, indigestion and concerned costs and treatment failure of the procedures. Stressors affected husbands in control group were body aches, tachycardia, and abdominal pain and concerned the cost and treatments failure and statistically significant differences were found.

In the study of Yakout et al.,⁽²⁰⁾ they concluded that stressors were a

common presentation among infertile couples, the study revealed that anxiety (83%) was the most significant emotional problems among studied subjects, followed by depression (77%), obsession (72%), psychosomatic disorders (65%), phobia (52%), and hysterical manifestation (2%).

Previous studies showed that psychological symptoms like depression and anxiety among infertile females who were infertile is high. Mild depression symptoms have been reported in 12% to 54% of women during infertility treatments. In addition, 12% to 24% of them have been reported to suffer from anxiety problem Volgsten et al.,⁽²⁵⁾

Regarding the current treatment's outcome among couples in the two studied groups, Among 50 couples in study group 31 couples had conception in the lab and the pregnancy test was positive for 14 couples and negative for other 17. And the other 19 couples had failed conception. In comparing with control group, 22 couples from 50 had conception in the lab and the pregnancy test was positive for 12 couples and negative for other 10. In the study of Ashrafi et al.,⁽²⁶⁾ they concluded that ICSI in an effective option in couples with different causes of infertility. These variables were integrated into a statistical model to allow the prediction for the chance of pregnancy following ICSI cycles.

In the study of Alasmari et al.,⁽²⁷⁾ they compared reproductive outcomes of ICSI for couples with unexplained infertility and couples with male factor infertility, the study revealed that fertilization rates were higher in the unexplained infertility group than in the severe and mild male infertility groups ($P < 0.05$).

In our study, satisfaction among couples related to health educational

program in the studied groups. The frequency of satisfied wives after the intervention in study group were 96% vs 84% in control group while the frequency of satisfied husbands after the intervention in study group were 94% vs 76% in control group with statistically significant differences between the two groups where ($P=0.023$). Also there was no statistically significant Relation between wives or husbands' success rate and each of age, education, No of previous trials, causes of infertility, complications and treatment outcomes.

In the study of Ferreira et al.,⁽²⁸⁾ they reported that the adjustment to fertility is influenced by age and by the existence of previous pregnancies on "Total Adjustment" ($p = 0,013$ and $p = 0,026$, respectively) and by the number of services one attends, in "Life on Hold" ($p = 0,024$). Marital satisfaction, is influenced by education level, educational programs and the beginning of infertility treatments on "Sexuality" ($p = 0,039$).

From the aforementioned data, we can conclude that, satisfaction is always related to the success of the effort done to achieve its goals, in our study, we succeeded to alleviate anxiety, increase knowledge and awareness, provide emotional and psychological support to the infertile couples included in our study.

Conclusion:

The current study finding concluded that an educational program was effective in preparing couples undergoing intracytoplasmic sperm injection to cope with the procedure and its implications and provide psychological support during the procedure.

Recommendation:

Based on findings, the study recommended that:

1. An educational program for intracytoplasmic sperm injection procedures should be given for infertile couples undergoing ICSI especially for the first trial of starting treatment and for the team working at ART and ICSI units especially for nurses about how to deal with infertile couples and preparing them.
2. Assessing the stressors levels and coping strategies used by couples
3. A certificate or license on ART for nursing as a new field for nursing practices.
4. Further studies must be conducted in the causes of ICSI failure and the investigation of the socio-demographic factors among couples undergoing ICSI procedures and its effect on the procedure outcome.

in each stage of the ICSI procedure and their effects is very important.

Table (1): Distribution of the studied groups according to their socio-demographic characteristics: Couples (N=100)

Items	Group				xz Test	P-value
	Study Group (n=50)		Control Group (n=50)			
	No.	%	No.	%		
Wife age (years):					---	0.308
<35	38	76	43	86		
≥35	12	24	7	14		
Range	27-39		27-39			
Mean ±SD	32.28±3.828		31.60±3.523			
Wife education:					---	0.842
University	24	48	26	52		
Basic/Intermediate	26	52	24	48		
Wife job status:					---	0.82
Housewife	28	56	26	52		
Working	22	44	24	48		
Husband age (ys.):					---	0.541
<40	28	56	32	64		
≥40	22	44	18	36		
Range	30-49		28-49			
Mean ±SD	39.28±6.283		37.54±6.152			
Husband education:					---	0.838
University	19	38	21	42		
Basic/Intermediate	31	62	29	58		
Husband job:					---	0.229
Employee	23	46	30	60		
Worker	27	54	20	40		
Residence:					--	0.230
Center governorate	22	44	29	58		
Different	28	56	21	42		
Income:					---	0.316
Sufficient	20	40	24	48		
Insufficient	30	60	26	52		

Table (2): Distribution of the studied groups according to their infertility history:

Infertility History	Group				Test	P-value
	Study (n=50)		Control (n=50)			
	No.	%	No.	%		
Infertility duration (years):					-----	1.000
<10	49	98	50	100		
≥10	1	2	0	0		
Range	2-11		2-9			
Mean ±SD	4.42±2.673		3.80±2.050			
Problem of infertility					0.54	0.909
Wife related cause	11	22	12	24		
Husband related cause	29	58	27	54		
Both	6	12	8	16		
Unidentified causes	4	8	3	6		
Male infertility causes:	n=29		n=27		0.03	0.985
Varicocele	8	27.6	8	29.6		
Oligospermia	9	31	8	29.6		
Sperm deformities	12	41.4	11	40.8		
Female infertility causes:	n=11		n=12		0.87	0.649
Irregular ovulation	4	36.4	7	46.7		
Tubal disease	4	36.4	3	20		
Uterine factors	3	27.2	5	33.3		

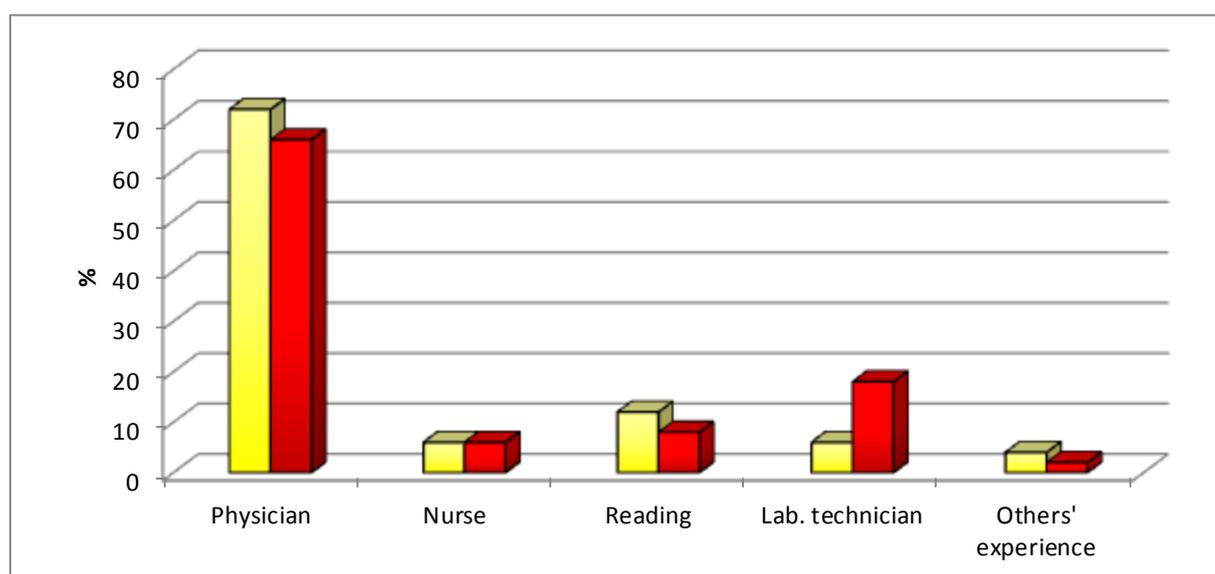
**Figure (1):** Distribution of the studied groups according to their source of information about intracytoplasmic sperm injection before the Intervention (n=100):

Table (3): Distribution of the studied groups according to their mean scores of knowledge and practices before and after the intervention:

Items	Group		P-value
	Study Group (n=50)	Control Group (n=50)	
Pre intervention			
Reproductive biology	52.56±6.437	48.26±5.158	<0.001*
ICSI procedure	7.40±3.687	3.94±1.942	<0.001*
Hormonal injection	9.86±3.58	9.70±3.627	0.825
Semen sample	42.12±10.474	51.80±6.506	<0.001*
Total mean	28.14±3.307	28.50±2.589	0.546
Post intervention			
Reproductive biology	75.46±8.384	57.60±6.649	<0.001*
ICSI procedure	97.20±0.833	75.60±3.104	<0.001*
Hormonal injection	93.76±3.820	83±4.957	<0.001*
Semen sample	93.2±4.71	78.90±9.869	<0.001*
Total mean	90.02±2.299	73.96±3.084	<0.001*

Table (4): Distribution of the studied groups according to Couples' stressors after the intervention:

Items	Wives				P-value	Husband				P-value
	Study Group (n=50)		Control Group (n=50)			Study Group (n=50)		Control Group (n=50)		
	No.	%	No.	%		No.	%	No.	%	
Cardiovascular:-										
- Hypertension	28	56	28	56	1.000	12	24	13	26	1.000
- Tachycardia	33	66	21	42	0.027	13	26	30	60	0.001*
- Sweating	22	44	29	58	0.230	19	38	25	50	0.314
Respiratory:										
- Dyspnea	33	66	25	50	0.156	25	50	22	44	0.689
-Breathlessness	21	42	28	56	0.230	28	56	22	44	0.317
Neuromuscular:										
- Body aches	27	54	24	48	0.689	24	48	31	62	0.228
- Dizziness	28	56	33	66	0.412	21	42	29	58	0.161
Gastro-intestinal										
- Indigestion	25	50	27	54	0.841	26	52	26	52	1.000
- Abdominal pain	29	58	24	48	0.423	25	50	31	62	0.314
- Nausea	30	60	20	40	0.071	26	52	29	58	0.688
Urinary:										
- Frequency	21	42	26	52	0.423	21	42	17	34	0.537
Psychological :										
-Anxiety	25	50	30	60	0.422	25	50	26	52	1.000
-Depression	28	56	23	40	0.424	19	38	21	42	0.838
-Body image	17	34	19	38	0.835	17	34	27	54	0.069
-Sexuality problems	28	56	25	5	0.689	24	48	18	36	0.311
- Phobias	32	64	25	50	0.225	22	44	22	44	1.000
Socio-economic										
- Increased costs	29	58	15	30	0.008*	50	100	50	100	1.000
- Concern about failure	23	46	24	48	1.000	50	100	50	100	1.000

- More than one answer.

Table (5): Distribution of the studied groups according to their current treatment's outcome:

Items	Group				P-value
	Study Group (n=50)		Control Group (n=50)		
	No.	%	No.	%	
Conception at lab	31	62	22	44	0.109
No of embryos					
Range	1-5		1-5		0.920
Mean ±SD	3.32±1.469		3.36±1.432		
Pregnancy test:					0.583
Negative	17	54.8	10	45.5	
Positive	14	45.2	12	54.5	

Table (6): Distribution of the studied groups according to their satisfaction related to Health educational program:

Items	Wives				P-value	Husband				P-value
	Study Group (n=50)		Control Group (n=50)			Study Group (n=50)		Control Group (n=50)		
	No.	%	No.	%		No.	%	No.	%	
Satisfied	48	96	42	84	0.092	47	94	38	76	0.023*
Unsatisfied	2	4	8	16		3	6	12	24	

References:

- World Health Organization (WHO): Infertility Geneva; (2013). Available at: www.who.int/reproductivehealth/topics/infertility/definitions.
- Maya N, Mascarenhas S, Boerma T, Vanderpoel S, Gretchen A: National, regional, and global trends in infertility prevalence since 1990: A systematic analysis of 277 health surveys". Public Library of Science; (2012), 9(12).
- Hsu Y.L, and Kuo B. J: Evaluations of Emotional Reactions and Coping Behaviors as Well as Correlated Factors for Infertile Couples Receiving Assisted Reproductive Technologies. J Nurs Res; 10(4): 291-301. Lucidi RS: Ovarian Hyperstimulation Syndrome. Medscape article. (2002).
- Aflatoonian A, Tabibnejad N: The epidemiological and etiological aspects of infertility in Yazd province of Iran. Iranian Journal of Reproductive Medicine; (2009) 7(3): 117-122.
- Centers for Disease Control and Prevention (CDC): Assisted reproductive technology (2012). Available at: <http://www.cdc.gov/art/>.
- Yanagida K: Recent Progress in In Vitro Fertilization and Intracytoplasmic Sperm Injection Technologies in Japan, JMAJ, January/February (2009); Vol. 52, No. 1 29.
- Jump up, Boulet S.L, Mehta A, et al, Trends in use of and reproductive outcomes associated with intracytoplasmic sperm injection. (2015) JAMA 313 (3): 255–63. doi:10.1001/jama.2014.17985. PMID 25602996.
- Kim H. J, Yoon H. J, Jang J. M, Oh H. S, et al, Comparison between intracytoplasmic sperm injection and intracytoplasmic morphologically selected sperm injection in oligo-astheno-teratozoospermia patients. Clinical and Experimental Reproductive Medicine, (2014) 41, 9–14. doi:10.5653/cerm.2014.41.1.9.
- Schmidt L, Holstein B.E, Christensen U, Boivin J: The social epidemiology of coping with infertility, Human Reproduction; (2004) 20(4): 1044-1052.
- Bartlam B& McLeod J: Infertility counseling: The ISSUE experience of setting up a telephone counseling

- service. Patient Education and Counseling, (2000) 41, 313–321.
- 11- Palha A. P & Lourenco M. F: Psychological and cross-cultural aspects of infertility and human sexuality. *Adv Psychosom Med. Basel. Karger*; (2011) 41:164–183.
 - 12- Eyo U. E, Upuji F. I, Ukpong E. I: Termination of pregnancy (top) related infertility in women in Akwa Ibom state. *Academic Research International*; (2012), 3(3): 120-124.
 - 13- Fraster D & Cooper M: *Myles text book of midwives (14th ed.)*. Churchill Livingstone: London, (2003), pp. 322 - 328.
 - 14- Gamel W.M, Hassan H.E, El-ezazy A.A: Male Infertility and Psychological Repercussions: A Neglected Problem in Northern Upper Egypt. *International Journal of Studies in Nursing*; (2019), Sep 30;4(4):1.
 - 15- Guo N, Hua X, Li YF, Jin L: Role of ICSI in non-male factor cycles as the number of oocytes retrieved decreases from four to one. *Current Medical Science*, (2018), Feb; 38(1):131-6.
 - 16- Pedro J, Frederiksen Y, Schmidt L, Ingerslev H.J, Zachariae R, Martins M.V: Comparison of three infertility-specific measures in men and women going through assisted reproductive technology treatment. *Journal of health psychology*. May (2019); 24(6):738-49.
 - 17- Heredia M, Tenias JM, Rocio R and Amparo F: Quality of life and productive factors in patients undergoing ART. *Europ. J. Obst Gyn. Reprod. Biology*; (2013) 167: 176-180.
 - 18- Kissi YE, Romdhane AB, Hidax S and Bannour S: General psychopathology, anxiety, depression and self-esteem in couples undergoing infertility treatment. *Europ. J. Obst and Gyn. and Reprod. Biology.*; (2013) 167(2): 185-189.
 - 19- Humaidan P, Kol S and Papanikolaou EG: GnRH agonist for triggering of final oocyte maturation: time for a change of practice? *Human Reproduction Update*; (2016)17: 510 – 524.
 - 20- Yakout S.M, Talaat M, Fayad E.M: Emotional problems of Infertile Egyptian women. *Journal of Nursing Education and Practice*. (2017);7(1).
 - 21- Youness E.M: Lifestyle factors between fertile and infertile women at Assiut Women's Health Hospital. *Egyptian Nursing Journal*. Jan, (2018) 1;15(1):9.
 - 22- Talarczyk J, Hauke J, Poniewaz M, Serdyńska-Szuster M, Pawelczyk L, Jedrzejczak P: Internet as a source of information about infertility among infertile patients. *Ginekologia polska*. Apr, (2012) 1;83(4):250-4.
 - 23- Ramadan S.A & Said A.R: Effect of an Educational Intervention for Infertile Women Regarding Natural Fertility Methods and Sexual Skills for Improving Sexual Function; *American Journal of Nursing*. (2018); 6(1):1-1.
 - 24- Farag A: Effect of counselling versus self-instructive brochure on preparation infertile couple to cope with IVF procedures. *Ain Shams University, Egypt*; (2010) 1-115.
 - 25- Volgsten H, Shoog S, Ekselius L, et al: Prevalence of psychiatric disorders in infertile women and men undergoing in vitro fertilization. *Hum Reprod*; (2008) 23: 2056-2063.
 - 26- Ashrafi M, Sadatmahalleh S.J, Akhoond M.R, Ghaffari F, Zolfaghari Z: ICSI outcome in infertile couples with different causes of infertility: a cross-sectional study. *International Journal of Fertility & Sterility*. Jul (2013);7(2):88.
 - 27- Alasmari W, Edris F, Albar Z, Eskandar M, Sultan C, Alboush A, Alasmari A: Comparable Reproductive Outcomes of ICSI for Couples with Unexplained Infertility and Couples with Male Factor Infertility. *Middle East Fertility Society Journal*. Dec; (2018) 1; 23(4):393-8.
 - 28- Ferreira M, Antunes L, Duarte J, Chaves C: Influence of infertility and fertility adjustment on marital satisfaction. *Procedia-Social and Behavioral Sciences*. Jan; (2015)16; 171:96-103.