Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 3, pp: (827-845), Month: September - December 2019, Available at: www.noveltyjournals.com

Designing Health Education Booklet about in Vitro Fertilization for Infertile Couples

[1]AmanyGhamemSaid, [2]Sahar Mohamed Soliman, [3]RashaAbasMohamed

Abstract: **Background: Worldwide, infertility affects 15%-20% of couples and most of them seek medical help including Assisted Reproductive Technology (ART) treatments. Assisted reproductive technologies (ART) have been developed as a superior method of treatment for most infertility disorders. In vitro fertilization (IVF) is one of the most important techniques of Assisted Reproductive Technology (ART). The provision of optimal care is the most important goal in nursing, through recognizing and meeting couples' educational needs.To promote couples' satisfaction, they should understand and participate in their medical decision making for better health outcome. Therefore, this study aimed to design health education booklet about in vitro fertilization for infertile couples. To accomplish the designing of the health education booklet throughout the present study, it was important to assess the infertile couples' knowledge, subjective practice and attitude in relation to in vitro fertilization (IVF).It has been carried out using a cross-sectional research design. The data was collected from 149of infertile couples. Six tools were used for data collection after reviewing the relevant literatures. There was poor score level of knowledge and improper practice regarding (IVF) among the majority of the couples undergoing IVF. Conclusion: majority of the studied infertile couples had poor knowledge and improper practice about (IVF). More educated people had more knowledge. All experts and infertile couples mentioned that the designed education booklet about in vitro fertilization is a good educational method that raised their awareness about this matter. It is proposed that in addition to the booklets/ brochures, mass media should have a role to increase couples' knowledge about ART.**

Keywords: **Infertility; Assisted reproductive techniques; In vitro fertilization; printed material.**

1. INTRODUCTION

Childbearing and parenthood are some of the most universally desired goals for couples. However, not all couples will achieve spontaneous pregnancy and a proportion may need medical help to resolve underlying fertility problems. Infertility has been recognized as a public health issue worldwide. World Health Organization (WHO) has defined infertility as a failure to conceive following one year of regular unprotected intercourse[1].Epidemiological data indicate that infertility is estimated to involve as many as 186 million people worldwide. It is reported by experts in the battlefield to be a problem that involves 15% to 20% of couples[2]. The World Health Organization reports that in developing countries one in four couples experience infertility [3].Rate of infertility in Sub Saharan Africa (SSA) range between 12.7% and 16.9% with a midpoint of 14.9% [4].According to a study conducted by the Egyptian Fertility Care Society and sponsored by the World Health Organization (WHO), infertility in Egypt affects 12 % of Egyptian couples; 4.3 % of them suffer from primary infertility and 7.7 % suffer from secondary infertility [5].

Management options available to infertile couples consist of three main interventions; medical, surgical and assisted reproductive technology (ART).ART allows clinicians and scientists to perform fertilization and early embryonic growth outside the human body. Therefore, the procedure bypasses several pathological conditions in women, including fallopian tubes and ovarian factors, and in men circumvents obstructive azoospermia and other sperm dysfunctions which are not curable by other medical or surgical options [6].The choice of treatment depends on the cause, efficacy, cost, availability of options and may be affected by cultural and religious considerations[7].In vitro fertilization (IVF) is one of the most important techniques of human assisted reproduction and it involves collecting oocytes from the female partner, fertilizing them in vitro with spermatozoa, subsequently the embryos are cultured up to day 3 or 5 and then transferred to the uterus with the purpose of achieving a pregnancy [8].

The first successful birth following an in vitro fertilization (IVF) procedure was in1978[9]. Since then, IVF and other techniques such as intracytoplasmic sperm injection (ICSI) have been implemented in clinics around the world to assist infertile couples. Indeed, it was estimated that from its inception in 1978 to 2012, approximately 6.5 million babies have been born worldwide by ART with large variation in availability, practice and results. [10-11]IVF services in the Middle East were initiated in the mid 1980's and were started in Egypt in1987. The service is practiced in a strictly religious manner and certain aspects of the technology such as sperm and oocyte donation are prohibited. [12-13].

One of the key responsibilities of health care providers is recognizing and meeting patients' educational needs. It is not only considered as fundamental to patient or client empowerment, but can also promote standards of care and provide high quality patient-centered care. [14]. Satisfaction with care can originate from adequate patient education, which enables patients to understand and participate in medical decision making which often result in better health outcomes. The educational printed material for example, the booklet serves the purpose to provide information and knowledge to a certain age group and for specific conditions. It is recommended to use educational material prepared by healthcare professional in order to reinforce the verbal communication. [65]

While there is widespread acknowledgement of the importance of patient education related to infertility. Most of the people had little knowledge about fertility and reproductive process especially in developing countries [14-15]. This finding underlines their need about that topic [16-17].

Thus it is deemed necessary to conduct this study todesign health education booklet about in vitro fertilization for infertile couples.

2. SUBJECTS AND METHOD

Design:

A cross-sectional design was used

Setting:

This study was carried out in Fertility center at Mansoura University (IVF) unit.

Subjects and sampling:-

1. **Subjects:** Infertile couples with infertility (primary or secondary). With female age ranged from (15-44) years old, undergoing IVF and without upper age limit for males

Sampling:

Sample size:-

The required sample size was 149of infertile couples after adding 10% for non-responders, when α=5%, Population size= 200 infertile couples who are monthly admitted to the Fertility center, desired precision= 5%, expected prevalence of correct knowledge about in vitro fertilization

= 50% and design effect= 1

Sampling technique:

Convenience sampling technique was used to recruit the study subjects.

Tools for data collection:

After reviewing the relevant literatures six tools were used in this study for data collection, as the following.

Tool I: Socio Economic Scale:

This tool was adopted from **Fahmy and El-SherbiniSocioEconomic Scale, (1983)** and was modified by **El Gelany, El-Wehadyand El-Wasify, (2012)** that included demographic characteristics of the studied participants such as age, residence, marital status and level of education. This scale was used to measure socio economic level of the studied

infertile couples, which include 7 domains: Education and cultural domain, Occupation domain, Family possessions domain, Family domain, Home sanitation domain, Economic domain, and Health care domain.

Tool II: Structured interview tool to assess couples 'health history

This tool was used to assess the infertile couple's family history, past medical and surgical history, past obstetric history, menstrual history, reproductive history, history of infertility, sexual history and health complain.

Tool III: Structured interview tool to assess couples' knowledge regardingInVitrofertilization(IVF).

This tool was used to assess the infertile couples' knowledge regarding modern assisted reproductive technology especially (IVF). It classified into four main categories (knowledge about Infertility, general knowledge about IVF, success rate and factors affecting it, and guidelines for IVF). These categories are composed of 58 questions, one mark awarded for each correct response. The total scores is divided into three levels; poor level = less than 50% of total scores (less than 29), fair level= 50% to 60% of total scores (29 to less than 34.8), good level= more than 60% of total scores (more than 34.8).

Tool IV: Structured interview tool to assess couples' subjective practice regarding IVF

This tool was used to assess the infertile couple's practice regarding IVF. It includes 96 questions about IVF pre and post-practice. The total scores of the practice are ranged from 0 to 58 for females and from 0 to 38 for males, with one point awarded for each correct answer.

The practice level was consisted of two categories, satisfactory (≥50%) (≥29 for females and ≥19 for males) andunsatisfactory(<50%) (< 29 for females and <19 for males).

Tool V: Structured interview tool to assess couples' attitude regarding IVF

This tool was used to assess the infertile couple's attitudes regarding IVF; it consisted of 27statements requiring a response on 3point Likert- rating scale with 3continuum (agree, neutral, disagree).Scoring system was used to quantify the couples' attitude; two marks were given to agree, one mark to neutral, and zero for disagree .If the statements were negative, the scoring system was reversed in SPSS as zero was given to agree, one mark was given to neutral, two marks to disagree which made up a total score of 54 marks .

Tool VI: Evaluation of thehealth educational booklet for internal validity:

Health education booklet evaluation tools were used to test validity of the designed health education booklet as the following:

A: scale for evaluating the designed health education booklet by professionals in the field of community health nursing, health education and gynecologist.

B: scale for evaluating the designed health education booklet by couples undergoing (IVF).

Method:

This study was accomplished throughout two main phases:

Phase I: Preparatory phase

Administrative process (Ethical considerations)

- An ethical approval was obtained from the Faculty of Nursing Research Ethics Committee (FNREC)/ Mansoura University to conduct the study.
- Informed consent was obtained from the studied couplesto participate in the study after clarifying the aim of the study and ensuring confidentiality of data.

Literature review:

Review of national and international literatures on the various aspects of the modern assisted technologies especially in vitro fertilization using scientific published articles, internet search and textbooks.

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 3, pp: (827-845), Month: September - December 2019, Available at: www.noveltyjournals.com

Developing of the study tools:

- Tools of data collection were developed by the researcher based on reviewing the relevant literature except tool (I) was adopted from **Fahmy and El-SherbiniSocioEconomic Scale, (1983)** which was modified by **El Gelany, El-Wehadyand El-Wasify, (2012)** .Tools were developed by the researcher based on reviewing the relevant literature. Validity of the developed tools was tested by the following: Content validity by submitting the tools to a jury of 5 experts in the field of "community health nursing". Face validity by conducting a pilot study on 10% of study sample (n= 15). Reliability for the attitude scale was done by using Cronbach's alpha and the result was 0.8. Based on the collected information, the necessary modifications were done, some questions were added, and others were clarified or omitted.

Phase II: Operational phase

II- Operational stage:

Data collection

The duration of data collection approximately 6 monthsfrom July to December 2017.The researcher started by introducing herself to the couples undergoing (IVF) and gave them a brief orientation about the aim of the study to gain their cooperation. The tools were filled by the researcher after interviewing the couples undergoing (IVF) at Fertility center at Mansoura University (IVF) unit.

Designing health education booklet

This booklet was designed by the researcher based on his preliminary assessment of couples undergoing (IVF) knowledge, practice and attitude related to in vitro fertilization (IVF).

Evaluation of the health education booklet

The designed health education booklet was submitted to group of expertise (gynecologist, professional in the field of health education and community health nursing)to evaluate the content validity and format before distributed it to the couples undergoing (IVF) and all their recommended modifications were done. The final health educational booklet was evaluated by the couples who agreed to evaluate it and their feedback was obtained.

Statistical analysis:

Data was sorted, coded, organized, categorized and then transferred into especially designed formats, performed using SPSS (Stands for Statistical Product and Service Solutions) version 20.0. Data were presented by using descriptive statistics in the form of frequencies and percentage. Arithmetic;

Mean± standard deviation for continuous variables and percentages for categorical variables. T test was used for comparison between 2 paired within one group. Chi square was used for testing significance of categorical data while Mont Carlo test was used if the expected cell count was <5. P< 0.05 was considered to be statistically significant. Spearmen correlation coefficients were used estimate correlation between the study variable to clarify positive or negative correlation .

3. RESULTS

Table (1)showsthe distribution of the studied couples according to their socio-demographic characteristics. It was observed that (47.7%) of the studied wives and (53.7%) of the studied husbands aged from 30 to less than 40 years, with mean age, (32.1±5.4 for wives 37.2±6.4 for husbands), while more than one third of the studied couples were university graduated. In relation to their working status, it was observed that (36.2%) of the studied wives, and (36.9%) of the studied husbands were manual workers. Regarding to their residence, more than half of the studied couples (57.7%) lived at rural area and less than half (42.0%) of them belonged to low socioeconomic status.

Table (2) Reveals distribution of the studied couples according to their knowledge regarding(IVF) .It was found that, the studied couples had poor score level of knowledge about infertility meaning and risk factors by (63.8%) for wives and (81.9%) for husbands, and poor score level of knowledge about general knowledge of (IVF) such as definition,indication ,steps, cryopreservation ,number of embryo .etc by (85%) for wives and (97.3%) for husbands. Their

knowledge related to success rate of (IVF) and factors affecting was poor by (88.6%) for wives and (98.7%) for husbands .Regarding their knowledge about guidelines for (IVF) such as diet, exercise, relaxation .stop of medication or herbs…etc, was poor by (75.8%) for wives and (92.6%) for husbands. The difference was significant between wives and husbands in relation to previous items

Table (3): Presents that the total main knowledge score of the studied couples about (IVF) was (19.7 ±7.8) for wives and (10.5± 3.9) for husbands. The difference was significant between the studied couples regarding the previous item.

Table (4): Shows subjective practice score about IVF of wives and husbands. There was improper practice score about IVF (66.7%) of wives with a mean score (27.6 ± 4.5) and (100%) of husbands, with a mean score (14.3 ± 3.2).

Table (5): Shows the correlation of knowledge and subjective practice score of the studied couples regarding their level of education and socioeconomic status. It was observed that, there were statistical significant relation between the studied couples' level of knowledge and their education and socioeconomic status. However, there was not any statistically significant relation between the studied husbands' subjective practice and their education and socioeconomic status. While there were statistically significant relation between the studied wives subjective practice and their socioeconomic status.

Table (6): Shows the attitude of wives and husbands related to IVF in relation to positive attitude, it was observed that both wives and husbands were having the same attitude regarding social and religious acceptance of IVF also they considered IVF the last chance.While there were significant differences between wives and husbands in relation to other items of attitude such as IVF is the preferred treatment for infertility and can eliminate infertility related family problems , IVF is accepted within their family, feeling of confidence in IVF and satisfaction with success rate of IVF ……etc

In relation to negative attitude, the studied wives and husbands were reported the same attituderelated to financial and psychological over load. However, there were significant differences betweenstudied wives and husbands related to their consideration that infertility is handicap and stigma for them and can lead to divorce and remarriage.

Table(7): Presents the mean difference of the studied couples according to their total attitude regarding IVF. It was observed that the mean difference of total attitude score for wives was 34.4± 3.2while the Mean difference of total attitude score for husbands was 33.8 ±3.7. There was not any statistical significance difference.

Table (8):present distribution of experts' evaluation regarding to the designed health educational booklet about in vitro fertilization for infertile couples .It was observed that all experts (100%) mentioned that the topic of educational booklet is important and significant for the target group. Also all of them stated that the developers of the booklet are mentioned, and the target group is determined and the objectives are specific, measurable, achievable, reliable and time bound (SMART).whilemost of them (90%) mentioned that the content is sufficient to achieve the objectives, appropriate to the level of understanding, updated, concise, relevant to the objectives, matched and adapted to the native culture and important points are stated and they approved that thebooklet with understandable language and composed of simple and popular words.

Table (9): presents distribution of experts' evaluation regarding to the quality ofmedia and total score of experts' evaluation. It was observed that all experts (100%) mentioned that the used media is attractive, grasping attention, clear and obvious. Also all of them stated that the media is appropriate to the content delivered to couples and the designed booklet is considered as a good tool for infertile couples to gain knowledge and practice about IVF. While 90% reported that the used media facilitate retailing, receiving knowledge and practices and facilitate retailing the content.

Table (10): Presents distribution of couples' feedback regarding to the designed health educational booklet about in vitro fertilization. (100%) of couples agreed that the designed booklet is suitable in size, pages number, quality of paper and printing and the cover of booklet is interesting, attract attention and the authors' names is clearly written on it, and the language of the booklet is simple, free from typographic and spelling errors, the way of writing is interesting for reading, and font size is clear and suitable for reading. While the majority of them (93.3%) stated that the colors and ideas used in the booklet are clear and attractive and organized.

Concerning the booklet content, all couples (100%) illustrated that the booklet contain the target group, general and specific objectives , its title is important to the reader and reflecting the content, the information presented in a sequential,

clear, smooth and concise manner and the introduction give clear idea about the aim and importance of it. Also the booklet is considered as a good educational tool for learning about in vitro fertilization.

4. DISCUSSION

Different techniques of Assisted Reproductive Technology (ARTs) play important roles in infertility treatment. One of the most common ARTs is In Vitro Fertilization (IVF). Providing information about treatments and related tests clarifies the chance of failure or success, so patients accept treatments realistically with better readiness and without improper expectations. The more they know about treatments and their process, the self-consciousness and mental relaxation of patients will be better. By the way, **(Bennett et al., 2015**) revealed that a few studies were done to assess the effect of general training on knowledge and attitude change of individuals [[14].

This study was accomplished with the aim of designing health education booklet about in vitro fertilization for infertile couples. Therefore, it was important to assess the infertile couples' knowledge, subjective practice and attitude in relation to in vitro fertilization (IVF).

The main age of the couples involved in this study, was (32.1±5.4 for female, 37.2±6.4 for male) similar to the main of three previous studies in governmental facilities in KSA which was(33.84 ± 6.06, 33.38 ± 5.39 , 32.9±5.7 for female, 39.2±7.4 for male) respectively, the first study collected data from infertile couples attending an IVF clinic in Riyadh **(Abolfotouh et al., 2013)** [15], and the second from an infertility clinic without IVF facilities in Al-Khobar**(Al-Turki, 2015)** [18].And the third study was designed to assess demographic and outcomes data from couples seeking IVF treatment in a private hospital in the Al Qassim district, Saudi Arabia **(Faisal etal. 2017)** [19]. Regarding socio demographic and socioeconomic characteristics; about more than one third of the studied couples are university graduated, more than one half of them are lived at rural area and more than one third of them belonged to low socioeconomic class. These findings are in line with Iranian study conducted by (**Afshani et al., 2015)**[20], who stated that, more than one third of the studied couples were university graduated and less than one third of them lived at urban area Furthermore, **(Pal et al., 2016)** [21]stated that about one half of the studied couples lived at rural area and more than one third of them belonged to low socioeconomic class.

As regards to the level of knowledge, the present study showed poor score level of knowledge about (IVF) among the majority of the couples undergoing IVF, which indicated by the low mean score for knowledge among them.This results agreed with a global survey findings which revealed that the whole level of knowledge regarding fertility and biology of reproduction was very poor among 17,500 women (mostly of childbearing age) from 10 countries in Europe, Africa, the Middle East and South America **(Ali, 2011)** [22].It also agreed with other studies conducted in Filnda and France found that women of reproductive age have insufficient fertility knowledge and awareness, with the primary areas limited awareness being reproductive lifespan and assisted reproduction**(Virtalaetal.,2011 / Daniluk&Koert, 2013 /Garcia etal.,2016).** [23-25]. Moreover, It is agreed with **(Daniluk&Koert, 2013)** [26].who reported that knowledge about fertility and ART among these childless Canadian men is low. But this finding was not in harmony with the study conducted by Okonofua in Benin City and Jimohin Ilorin, Nigeria **(Okonofua&Obi, 2009/ Jimoh, 2004).** [27-28]**.** who found that acceptability and awareness about Assisted Reproduction Technologies (ART) is high .This is because ART services are rendered in these two cities which enhance awareness as opposed to other cities.

The researcher point of view showed that, the lack of knowledge about IVF may be related to various reasons; first, this topic was not among couples or media concern and is shaming to talk about it. Second, the health care providers didn't train to deal with these clients.

The current study revealed that husband knowledge related to in vitro fertilization was less than wives knowledge. These results are similar to the findings of **(Bunting et al., 2013/Daniluk and Koert, 2015/ Maeda et al., 2015)** [29-31] who found that men were less knowledgeable than women, because mothers experienced more psychological stress as social emphasis on the role of being a mother and fear of losing marriage.

This situation disturbs women and they easily lose their self- esteem; consequently, they look for more information about fertility, start the treatment as soon as possible, and become more hopeful of having a child. The results of this study with

the findings of **(Judithetal.,2013/Daniluketal.,2012/Brethericketal .,2010)** [26,32-33]suggest that there is an alarming gap in fertility and ART knowledge among currently childless adult men and women.

The current study found that education and socioeconomic class positively correlated with fertility knowledge, which is in accordance with (**Daniluketal., 2012, Bunting et al., 2013)** [29, 32]**,(Almeida-Santos et al., 2017,Chsambers et al., 2013)** [34-35]studies who found that fertility knowledge also varied in terms of socio-demographic variables, with those who had higher income, those who worked those who were older and those who had greater education being better informed. Furthermore, a comparative study in Australia found that women from higher socioeconomic class use more ART treatment than those in the lower class probably because of likely higher educational status and ability to pay for services**(Chsambers et al., 2013)** [35].For men being from a low socio-economic status background were associated with lower knowledge scores **(Quach&Librach, 2008 /Daniluk&Koert 2013)** [24-36].The highly educated respondents were more likely to have access to sources of information on ART including the internet, the media and specialist health practitioners. They are also more likely to have come across ART related literature to know the solutions for infertility, where one could get ART services and challenges to ART. Poor fertility knowledge will be a contributory factor to many people to not achieve their goal of parenthood **(Everywoman, 2013)** [37].

The present study showed that, majority of the studied couples had improper practice regarding IVF which is in line with (**Okwelogu et al., 2012)** [38] who found that the majority of the women attending fertility clinics in Okija are unaware of IVF practice and they need to be educated about this practice. Fertility and parenthood are highly valued in Africa to the extent that procreation is usually considered the most important purpose of marriage **(Pedro, 2015)** [39]. From the researcher point of view, the improper practice of the studied couples may be due to poor level of knowledge related to IVF in our environment. Furthermore, the perception among those who have the knowledge is poor.

In relation to the attitude of the studied couples regarding infertility, the present study reported that, more than half of the studied wives and more than two thirds of the studied husbands agreed that wives, mostly blamed for infertility. This finding is in agreement with the common belief Sub Saharan Africa (SSA), which claimed that woman is mainly responsible for infertility, especially after years of marriage **(Sackitey, 2016)** [40].However, the rationale for blaming women may not be justified as infertility is soaring among men and approximately one third of infertility casesinvolve female factors only, one third due to male factors only, and one third due to a combination of male and female factors **(Greiletal., 2014)** [41].But, male infertility is not well reported because men are reluctant to medical visits. Besides, cultural and social representations of infertility most often give clearance to men regarding the responsibility of the infertility inside couple to blame the female partner.**(Nwajiaku et al., 2012,Agarwal et al., 2015)** [42-43]**.**Are suggested that our respondents, on average, had falsely expectations about the causes of infertility.

Infertility has been described as a threat to marital stability in developing countries **(Greil et al., 2010**) [44]**.** In these nations, a woman's economic and social value is directly tied to her ability to conceive and give birth to children. Because of this, the psychosocial consequences of infertility such as divorce or abandonment of the wife and remarriage are common **(Martinsetal., 2014)** [45]**.**This is in line with the finding of the present study in which, more than two thirds of the studied wives and less than one-third of the studied husbands agreed with remarriage and less than two thirds of the studied wives and less than one-third of the studied husbands agreed with divorce. But it is not in line with recent studies that showed that infertile couples who seek treatment have strong marital adjustment; and infertility can strengthen their relationship when the infertile couples in treatment were determined not to sacrifice their relationship to the quest for a baby and that infertility is a problem that should be faced jointly and that intimacy can be improved during treatment through communication, support, and consideration of one's partner. Strong marital relationships have helped couples persist through the physical and emotional hardships of the treatment experience **(Ying et al., 2015)** [46]**.** These variations may be returned to difference in culture and sitting of respondents.

The result of this present study reported that infertility was not considered as a stigma among the studied couples. Unlike **(Greiletal., 2016)** [47]who reported thatinfertility can be a greater source of stigma and shame than for women in societies where voluntary childlessness is acceptable .The discrepancy in findings may be attributed to differences in either the culture or sitting or study design.

The result of the current study revealed that, most of the studied couples were aware that IVF was associated with psychological, physical and financial over load, which is in line with**(Takaki&Hibino, 2014)** [48]**.**Who found that ART

treatments create many physical, economic and emotional burdens. However, this finding is not in accordance with other study in which the women were largely un aware of the costs, availability of, and health risks associated with ART treatments**(Sazonova et al., 2012)** [49]**.**

The psychological consequences associated with infertility treatments, mostly anxiety, and depression may be due to low ART treatment outcomes **(Paschetal., 2012\ Karabulut et al., 2013)** [50-51].Economic burdens of IVF may be due to high cost of IVF cycle and absence of insurance coverage. The time spent seeking infertility care may also cause financial burdens because of lost wages and other economic hardships. Time spent on care may represent a significant social and mental burden. **(Wu et al., 2013)** [52]**,** reported that during a period of 18 months, an average 125 hours were spent on fertility care, which is equal to more than 15 working days. Moreover, some couples have to travel to another city, which is more costly, as there are no specialists at their city of residence. These issues can affect their attitude and some of them may leave the whole treatment. Therefore, it can be claimed that socioeconomic status may change the couples 'attitude **(Suzuki et al., 2006**) [53]. Absence of insurance coverage for fertility treatment may returnto scarce resources and high prevalence of infertility.

Physical burdens of IVF may be due to adverse effect of IVF, which include ovarian hyperstimulation syndrome that can occur in the days and weeks after IVF processes. The key feature is an increase in vascular permeability of the ovaries that results in leaking fluid into abdomen and swelling of the ovaries (**Steward et al., 2014)** [54].

The present study revealed that, IVF was accepted within the most of the studied couple's families. This finding is in line with **(Afshanietal., 2016)** [55]who found that there was a significant statistical relationship between the couple's attitude and their family's attitude**.** It is obvious that when couples have positive attitude toward ART, they can accept it easier. Infertility can be stressful for couples; it may have an effect on the quality of their relationship with their family, as well as the relationship between husband and wife. In such a critical situation, the full support of families can influence the couples' mental health. If a couple's family has full understanding and a great empathy with them, they can accept the reality with less difficulty ,Therefore, being supported by family reduces the couple's negative thoughts and loneliness. Consequently, their positive point of view makes them more willing to choose ART.

It has been claimed that social factors affect the attitude of infertile people, for example when they want to choose between two ART procedures **(Maheshwarietal., 2011)** [56].

The present study revealed that, IVF was socially and religiously accepted within the majority of the studied couples and there was not any statistical difference between the studied wives and husbands in these regard which is in accordance with**(Sharma ,2014,Malhotra etal., 2013)** [57-58].Who reported that the technical, social, ethical and legal issues of ART have been well documented all over the world as well as Asia.But it contradicts with other study in which a lot of Iranian people don't know about the exact issues of this technology**(Afshanietal.,2016)** [55].These variation may be returned to difference in culture, legal and ethical issues between different countries.

The present study revealed that, around one half of the studied husbands and two thirds of the studied wives were confident about the ability of IVF treatment to treat infertility, which is in line with previous studies in which the women and the men were unrealistically confident about the ability of IVF treatment to treat infertility and compensate for age-related fertility declines**(Abolfotouh et al., 2013, Judith etal., 2013, Daniluketal., 2012)** [15-26-32].There was statistical significance difference between the studied wives and their husbands may be due to gender variation and had falsely expectations about the success rate concerning (IVF) treatment so they are in need of health education about that technology.

The present study found that more than one third of the studied wives and less than quarter of the studied husbands agreed that success rate of IVF is associated with lifestyle this finding is similar to the findings of **(Meldrum, 2017)** [59], who reported that lifestyle modifications, in particular a healthy diet and exercise during the 3-6 months before conception and during treatment, should result in better fertility treatments outcomes.The significant difference between wives and husbands regarding to the effect of lifestyle on success rate of IVF may be related to lack of fertility knowledge among the studied husbands. Based on the previous findings of the current study as lack of knowledge and improper practice of couples, the health educational booklet about (IVF) for infertile couples was developed. The health educational content was evaluated based on SMART (specific measurable, achievable, relevant and time bound) as the basis for monitoring

the content to achieve the objectives **(Evaluation Research Team 2009, Bowman, et al 2015)** [60-61]. This was in a line with the present study in which all experts mentioned that the educational booklet's objectives are SMART. The present study revealed that most of experts approved that the booklet with understandable language and composed of simple and popular words. In addition, all of them showed that the language is explanatory and conversational as well as language are suitable for readers. Moreover, they mentioned that the headings and subheadings are identified to assist the learning process. The majority of experts stated that the content is matched and adapted to the native culture and important points are stated. Accordingly, all couples reported that the language of the booklet is simple, free from typographic and spelling errors, the way of writing is interesting for reading, and font size is clear and suitable for reading. While the majority of them stated that the ideas are clear and organized. These findings agreed with the findings of **(Pierce, 2010)** [62]who stated that gender-free or neutral languages, as well as sensitivity to the cultural values and beliefs of diverse communities, must be considered through designing the health educational booklet. When writing, find alternatives for complex words, medical jargon, abbreviations, and acronyms to make the material more readable. Likewise, keep your language conversational and use complex words mainly for precision. The current study stated that all experts mentioned that illustrations are simple, appropriate, integrated with the text and outlines are consequently presented. Also all the experts mentioned that the size and style of the letters and the spacing and length of the lines are suitable. Also the subheadings or the inner margins make reading and memorization easier and format of the material are appropriate **(Williams etal., 2016)** [63] Regarding couples feedback. Their evaluation is important to make sure that the content, layout and design are acceptable for them. all couples reported that the designed booklet suitable in size, pages number, quality of paper and printing and the cover of booklet is interesting, attract attention and the authors' names are clearly written on it. While the most of them stated that the booklet colors are clear and attractive. Also the majority of couples mentioned that the booklet headlines are clear, sequential and cover the entire topic, and the used pictures characterized by clarity, good quality and associated with information. These findings are in the same line with (**Aldridge, 2004,Pierce, 2010)** [62-64]study who stated that in developing written educational material, consider using colors that are appealing to your target audience. Use photos with concise captions and keep captions close to the images. Avoid graphs charts unless they actually help readers understand content. Balance the use of text, images, and white space. Some writers use chunking of information, which is simply splitting the information into short, easily scannable elements, which helps to cluster main ideas. Also these findings are in the same line with **(Pierce, 2010)** [62]study who reported that use bullets for attention and for the main points in the text. Avoid words or sentences in all capital letters, and avoid italic font because it is harder to read. Do use bolded subheadings to separate and highlight sections and, when possible, spell out fractions and percentages it makes the text easier to read and understand

5. CONCLUSION

The desire to reproduce is a basic human need. However, for many individuals, the chances of having a genetic child are compromised by a number of factors so the need for ART becomes mandatory. Our present study showed that, the majority of studied couples had poor knowledge and poor subjective practices related to in vitro fertilization (IVF). Concerning the studied couples' attitude, most of them reported that in vitro fertilization (IVF) is important treatment for infertility and it can eliminate infertility related family problems there was statistically significant relation between the studied couples' level of knowledge and their education and there was a positive attitude towards ART. Since making a decision and accepting, ART can be influenced by couple's attitude, their family's attitude, and their awareness. Infertile couples with the most positive attitude are more willing to choose (ART) to become parents; therefore, they need to be educated about (ART).All experts and infertile couples mentioned that the designed education booklet about in vitro fertilization is a good educational method in raisingtheir awareness about this matter. **Recommendations**

The following recommendations are based on the findings of the study:-

- Public health education programs are important to enhance fertility awareness and increase knowledge of ART for adult women and their husbands, and to support informed reproductive decision-making.
- Public Health Education Campaigns and the role of broadcasting should be directed toward correcting erroneous beliefs about the risk factors associated with infertility and infertility treatment especially in rural areas with low literacy.

- Health insurance should have a role to help infertile couples in order to warm-up the family through fertility assistance, so That no more couples are deprived from this blessing because of infertility cost.
- Future research is necessary to determine the extent to which the pattern of attitudes found here is representative of that in the population facing infertility as well as in the general population and Evaluate the effectiveness of the booklet as a source of information on IVF .

6. ACKNOWLEDGEMENTS

We would like to thank all couples who participated in the study for their help and cooperation during the study period and appreciate the great efforts of the supervisors in this work.

Table (1): Distribution of the studied couples according to their socio-demographic characteristics

Socio-demographic characteristics	Wives (N = 149)		Husbands (N= 149)	
	No.	%	No.	%
Age				
less than 20 years	2	1.3	0	0.0
20- less than 30 years	67	45.0	8	5.4
30- less than 40 years	71	47.7	80	53.7
40-50 years	9	6.0	61	40.9
Educational level				
Illiterate/ can read and write	16	10.7	20	13.3
Primary and preparatory	39	26	32	21.8
Secondary education	41	27.5	41	27.5
Higher education	53	35.8	56	37.4
Working status				
Not work/ housewives	34	22.8	0	0.0
Manual worker	54	36.2	55	36.9
Trades/ business	15	10.1	39	36.2
Semi-professional/ professional	46	30.9	55	26.9
Residence				
Urban	63		42.3	
Rural	86		57.7	
Socioeconomic level				
Very low	0		0	
Low	63		42.0	
Middle	52		34.7	
High	34		22.7	

Table (2): Distribution of the studied couples according to their knowledge regarding to (IVF)

Knowledge level	Wives (n = 149)		Husbands (n=149)		Significance	P value*
	N	%	N	%		
Infertility related knowledge (3mark)						
Poor	95	63.8	122	81.9	χ^2=12.359	<0.001**
Fair	0	0	0	0		
Good	54	36.2	27	18.1		
General knowledge about IVF (30 mark)						
Poor	127	85	145	97.3	Monte Carlo	<0.001**

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 3, pp: (827-845), Month: September - December 2019, Available at: www.noveltyjournals.com

Fair	14	9.5	2	1.3	test	
Good	8	5.5	2	1.3		
Success rate and factors affecting it (12 marks)						
Poor	132	88.6	147	98.7	χ^2=12.781	0.002*
Fair	5	3.4	1	0.7		
Good	12	8.1	1	0.7		
Guidelines for IVF (13 marks wives and 8 marks for husbands)						
Poor	113	75.8	138	92.6	χ^2=19.725	<0.001**
Fair	13	8.7	0	0		
Good	23	15.4	11	7.4		
Total knowledge(58 marks for wives and 53 marks for husband)						
Poor	128	85.3	149	100	χ^2=22.592	<0.001**
Fair	15	10.0	0	0		
Good	6	4.7	0	0		
Mean(SD)	(19.7 ±7.8)		(10.5± 3.9)		t=12835	<0.001**

χ^2: Chi square test. * Statistically significant result if P ≤ 0.05, **Highly statistically significant result
T: students t test

Poor: more than 50%of total score

Fair: from (50-60%) of total score

Good: more than (> 60%) of total score

Table (3): Distribution of the studied couples regarding their main knowledge domain about IVF.

Main Knowledge domain	Knowledge level						Significance	P value*
	Poor (< 50%)		Fair (50-60%)		Good (> 60%)			
	N	%	N	%	N	%		
Wives (19.7 ±7.8)	128	85.3	15	10	6	4.7	χ^2 = 22.592	< 0.001**
Husbands(10.5± 3.9)	149	100	0	0	0	0		
	Mean + SD							

χ^2:Chi-square test.

Table (4): Subjective practice score about IVF between the studied husbands and wives.

Main activity(practice) domain	activity level				Significance	P value*
	Improper (<50%)		Proper (≥50%)			
	N	%	N	%		
Wives (27.6 ± 4.5)	100	66.7%	49	32.7%	χ^2 = 58,643	P= <0.001
Husbands (14.3 ± 3.2)	149	100%	0	0%		

Table (5): correlation between the studied wives' knowledge and subjective practice regarding their level of education and socioeconomic status.

Correlated items	Knowledge				Subjective practice			
	Wives		Husbands		Wives		Husbands	
	Rho	P	Rho	P	rho	P	rho	P
Level of education	0.280	0.001	0.286	<.0001	0.139	0.092	0.111	0.18
Socioeconomic status	0.236	0.004	0.243	0.003	0.205	.012	.083	0.31

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 3, pp: (827-845), Month: September - December 2019, Available at: www.noveltyjournals.com

Table (6): Distribution of the studied couples according to their attitude regarding in vitro fertilization (IVF)

Positive attitude	Wives (n = 149)						Husbands(n=149)						Significance	P value*
	Agree		Neutral		Disagree		Agree		Neutral		Disagree			
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)		
Infertility is a curable disease	130	87.2	3	2.1	16	10.7	130	87.2	15	10.1	4	2.7	χ^2 = 15.200	P=0.001**
Infertility must be treated medically	145	97.3	1	0.7	3	2.0	139	93.3	9	6.0	1	0.7	Monte Carlo test	P= 0.02*
IVF can eliminate infertility related family problems	106	71.1	42	28.2	1	0.7	115	77.2	25	26.8	9	6.0	χ^2 = 11.080	P=0.004**
IVF is the last hope for you	83	55.7	45	30.2	21	14.1	88	59.1	30	20.1	31	20.8	χ^2 = 5.069	P=0.079
IVF is socially accepted method	148	99.3	0	0	1	0.7	148	99.3	0	0	1	.07	……	…….
IVF is religiously accepted	148	99.3	0	0	1	0.7	148	99.3	0	0	1	.07	……	…….
IVF is accepted within your family	135	90.6	12	8.1	2	1.3	147	98.7	0	0	2	1.3	Monte Carlo test	P=0.001**
IVF is the preferred treatment for infertility	104	69.8	36	24.2	9	6.0	75	50.3	60	40.3	14	9.4	χ^2 = 11.785	P=0.003**
Cryopresvation is important in IVF cycle	64	43.0	65	43.6	20	14.3	25	16.8	54	36.2	70	47	χ^2 = 45.884	P<0.001**
Feeling of confidence in IVF	104	69.8	36	24.2	9	6.0	75	50.3	60	40.3	14	9.4	χ^2 = 11.785	P=0.003**
Success rate of IVF is satisfied	87	58.4	61	40.9	1	0.7	66	44.3	79	53.0	4	2.7	Monte Carlo test	P=0.02*
Success rate of IVF is associated with lifestyle	51	34.2	57	38.3	41	27.5	17	11.4	83	55.7	49	32.9	χ^2 = 22.540	P<0.001**
Attitude score for positive concepts (total = 24	19.9± 2.6						18.5± 2.5						t= 4.655	P<0.001
Negative attitude	Wives (n=149)						Husbands (n=149)						Significance	P value
	Agree		Neutral		Disagree		Agree		Neutral		Disagree			
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)		
Infertility is an infectious disease	1	0.7	0	0.0	148	99.3	1	0.7	0	0.0	148	99.3	…….	……
Infertility is a hereditary disease	5	3.4	16	10.7	128	85.9	1	0. 7	21	14.1	127	85.2	Monte Carlo test	P= 0.178
Infertility is an handicap condition	40	26.8	22	14.8	87	58.4	47	31.5	36	24.2	66	44.3	χ^2 = 6.825	P=0.03*
Infertility is stigma	9	0.6	51	34.3	89	59.7	22	14.8	41	27.2	86	57.7	χ^2 = 6.590	P=0.04*
Infertility can lead to remarriage	105	70.5	21	14.1	23	15.4	32	21.5	35	23.5	82	55.0	χ^2 = 75.550	P<0.001**
Infertility can lead to divorce	43	28.9	56	37.6	50	33.5	91	61.1	31	20.8	27	18.1	χ^2 = 31.248	P<0.001**
Wife mostly blamed for infertility	94	63.1	51	34.2	4	2.7	65	43.7	72	48.3	12	8.0	χ^2 = 12.875	P=0.002**
Wife should be examined firstly	7	4.7	128	85.9	14	9.4	3	2.0	140	94.0	6	4.0	χ^2 = 5.337	P=0.069
IVF represents financial over load	148	99.3	0	0	1	.07	148	99.3	0	0	1	0.7	……	……
IVF represents psychological over load	148	99.3	0	0	1	0.7	148	99.3	0	0	1	0.7	……	……
IVF represents physical over load	148	99.3	0	0	1	0.7	144	96.6	4	2.7	1	0.7	Monte Carlo test	P=0.117

IVF has an adverse effect on the mother	64	43.0	62	41.6	23	15.4	4	2.7	120	80.5	25	16.8	χ^2 = 71.508	P<0.001**
IVF has physical adverse effectsonthe baby	1	0.7	43	28.8	105	70.5	1	0.7	46	30.8	102	68.5	Monte CarloTest	P=0.902
IVF has psychological adverse effects on the baby	1	0.7	28	18.8	120	80.5	1	0.7	24	16.1	124	83.2	Monte Carlo test	P=0.826
I prefer to implant multiple embryo	63	42.3	84	56.4	2	1.3	60	40.2	88	59.1	1	.07	Monte Carlo test	P=0.795
Attitude score for negative concepts (total = 30)	14.5 ± 1.6						15.3± 2.5						t=3.351	P=0.001

χ^2: Chi square test. * Statistically significant result if P ≤ 0.05, **Highly statistically significant result

Table (7): Mean difference of the studied couples according to their total attitude regarding IVF.

Attitude score	Wives N = 149	Husbands N = 149	Significance	P value*
	Mean (SD)	Mean (SD)		
Attitude score for positive concepts (total = 24)	19.9 (2.6)	18.5 (2.5)	t= 4.655	P<0.001
Attitude score for negative concepts (total = 30)	14.5(1.6)	15.3 (2.5)	t=3.351	P=0.001
Total attitude score(total = 54)	34.4(3.2)	33.8 (3.7)	t=1.432	P = 0.153

T (Paired – Samples T test)

* Significant (p< 0.05)

Table (8): Distribution of experts' evaluation regarding to the designed health educational booklet about in vitro fertilization for infertile couples.

Items	N =(10)	%
Topic		
The topic of health educational booklet is important.	10	100
The topic of health educational booklet is signified.	10	100
Author and target group		
Names of the developers of the booklet are mentioned.	10	100
The target group is determined.	10	100
Objectives and contents		
The objectives are specific.	10	100
The objectives are measurable.	10	100
The objectives are achievable.	10	100
The objectives are reliable.	10	100
The objectives are time bound.	10	100
Content is sufficient to achieve the objectives.	9	90
Content is understandable.	9	90
Content is updated.	9	90
Important points are stated.	9	90
Content is matched to the native culture.	9	90
Information is adapted to the native culture	9	90
Content is concise.	9	90
Content is relevant to the objectives.	9	90
Content is written in a student-oriented style.	9	90

Literary Presentation		
Language is neutral (no comparative adjectives, promotion or false appeals)	9	90
Language is explanatory	10	100
Language is conversational and, in at least 50% of the material, written in the active voice	10	100
Most of the vocabulary is composed of popular words.	9	90
Headings and subheadings are identified.	10	100
Vocabulary is composed of simple words	9	90
Language is suitable for readers.	10	100
Planning and sequence of information are consistent, making it easier for the readers to predict its flow.its flow.	9	90
Material is friendly to reader.	9	90
Illustrations		
Illustrations are simple.	10	100
Illustrations are appropriate.	10	100
Illustrations are present an easily understandable outline.	10	100
Illustrations are related to the text (express the desired purpose).	10	100
Illustrations are integrated with the text (easily located).	10	100
Legibility and printing characteristics		
Size of the letters is suitable.	10	100
Style of the letters is appropriate.	10	100
The space between lines is suitable.	10	100
Length of the paragraphs is proper.	10	100
Use of bold characters and bullet points draw attention to specific points or key content	10	100
Subjective use of blank space reduces overcrowded appearance.	10	100
Contrast between the printed content and the paper.	10	100
Subheadings or the inner margins make reading and memorization easier	10	100
Spacing between paragraphs is appropriate	10	100
Format of the material is appropriate	10	100

Table:(9) Distribution of experts' evaluation regarding to the quality of media and total score of experts' evaluation

	Quality of Media	
The media is appropriate to the content delivered.	9	90
The used media facilitate retailing the content.	9	90
The used media facilitate receiving knowledge and practices.	10	100
The used media is attractive.	10	100
The used media is grasping attention.	10	100
The used media is clear.	10	100
The used media is obvious.	10	100
Total score of experts' evaluation • **Good**	10	100

Table (10): Distribution of couples' feedback regarding to the designed health educational booklet about in vitro fertilization and total score of couples' evaluation

Item	N=(30)	%
Technical aspects of the booklet		
Suitable size booklet	30	100
Number of booklet pages are suitable	30	100
Quality of printing and type of paper are good	30	100
The authors' names written clearly on the cover of the booklet	30	100
The cover of the booklet is interesting and attracts attention	30	100
The cover image is suitable to the topic	30	100
The colors used in the booklet clear	28	93.3
The colors used in the booklet attractive	28	93.3
Linguistic aspects of the booklet		
The language of the booklet is simple	30	100
The way of writing is interesting for reading	30	100
The booklet free from typographic and spelling errors	30	100
The font size is clear and suitable for reading	30	100
The ideas are clear	28	93.3
The ideas are organized	28	93.3
The booklet content		
The booklet title is important to the reader	30	100
The booklet title reflect its content	30	100
The booklet points the target group	30	100
The booklet contain the general and specific objectives	30	100
The introduction of booklet give clear idea about aim and importance of it	30	100
The booklet headlines are clear and sequential	28	93.3
The booklet content cover all the topic	28	93.3
The booklet information presented in a sequential, clear, smooth and concise manner	30	100
The used pictures characterized by clarity and good quality	28	93.3
The used pictures associated with the information	28	93.3
The used pictures explained the information	28	93.3
Total score of couples' feedback **Good**	30	100

REFERENCES

[1] **World Health Organization (2013)**. Sexually transmitted and other reproductive tract infections. World Health Organization: Geneva. p. 182-184

[2] **Marcia C, Pasquale P. Infertility around the globe. (2015)** new thinking on gender, reproductive technologies and global movements in the 21st century. Human Reproductive update 2015**.**

[3] **World Health Organization (WHO) (2017).** Global prevalence of infertility, infecundity and Childlessness (Retrieved from)http://www.who.int/reproductivehealth/topics/ infertility/burden/en/.

[4] **Agarwal A, Mulgund A, Hamada A, Chyatte MR (2015)**. A unique view on male infertility around the globe. Reprod. Biol. Endocrinol. 13(1):37.

[5] **Egyptian Fertility Care Society**: Community-based study of the prevalence of infertility and its etiological factors in Egypt: (1) The population-based study. Cairo Egyptian Ferti Care Soc 2009

[6] **Kamel RM. (2013).** Assisted reproductive technology after the birth of Louise Brown. J ReprodInfertil 2013; 14: 96–109.

[7] **Boivin J, Bunting L, Collins JA, et al.** International estimates of infertility prevalence and treatment-seeking: potential need and demand for infertility medical care. Hum Reprod 2007; 22: [PubMed] [Google Scholar]**.**

[8] **Farquhar C, Rombauts L, Kremer JAM, Lethaby A, Ayeleke RO**. **(2017).**Oral contraceptive pill, progestogen or oestrogen pretreatmentfor ovarian stimulation protocols for women undergoing assisted reproductive techniques. Cochrane Database of SystematicReviews 2017, Issue 5. Art. No.: CD006109. DOI: 10.1002/14651858.CD006109.pub3.

[9] **Steptoe PC and Edwards RG.(1978).** Birth after the reimplantation of a human embryo. Lancet 1978; 312:366.[PubMed] [Google Scholar].

[10] **Calhaz-Jorge C, De Geyter C, Kupka MS, et al. (2012).**Assisted reproductive technology in Europe, 2012: Results generated from European registers by ESHRE. Hum Reprod 2016; 31: 1638–1652**.**

[11] **Hann, M., Roberts, S. A., D'Souza, S. W., Clayton, P., Macklon, N., & Brison, D. R. (2018).** The growth of assisted reproductive treatment-conceived children from birth to 5 years: a national cohort study. *BMC medicine*, *16*(1), 224.)

[12] **Inhorn, M. C. (2012)**. *Local babies, global science: gender, religion and in vitro fertilization in Egypt*. Routledge.

[13] **Sallam, H. N., & Sallam, N. H. (2016)**. Religious aspects of assisted reproduction. *Facts, views & vision in ObGyn*, *8*(1), 33.

[14] **Bennett, L. R., Wiweko, B., Bell, L., Shafira, N., Pangestu, M., Adayana, I. P.& Armstrong, G. (2015).** Reproductive knowledge and patient education needs among Indonesian women infertility patients attending three fertility clinics. *Patient education and counseling*, *98*(3), 364-369

[15] **Abolfotouh MA, Alabdrabalnabi AA, Albacker RB, et al.(2013)** Knowledge, attitude, and practices of infertility among Saudi couples. Int J Gen Med 2013: 563–573.

[16] **Ezabadi Z, Mollaahmadi F, Mohammadi M, Omani Samani R, Vesali S (2017) .** Identification of reproductive education needs of infertile clients undergoing assisted reproduction treatment using assessments of their knowledge and attitude. Int J Fertil Steril. 2017; 11(1): 20-27.

[17] **Mourad S, Hermens R, Cox-Witbraad T, Grol R, Nelen W, et al .(2009).** Information provision in fertility care: a call for improvement. Hum Reprod 2009;24: 1420–1426.

[18] **Al-Turki HA.(2015).** Prevalence of primary and secondary infertility from tertiary center in eastern Saudi Arabia. Middle East Fertil Soc J 2015; 20: 237–240.

[19] **Almaslami, F., Aljunid, S. M., & Ghailan, K. (2018).** Demographic determinants and outcome of in vitro fertilization (IVF) services in Saudi Arabia. *Journal of International Medical Research*, *46*(4), 1537-1544.

[20] **Afshani, S. A., Abdoli, A. M., Hashempour, M., Baghbeheshti, M., & Zolfaghari, M. (2016)**. The attitudes of infertile couples towards assisted reproductive techniques in Yazd, Iran: A cross sectional study in 2014. *International* Journal of Reproductive BioMedicine, 14(12),

[21] **Pal, M., Devgun, P., Chalana, H., Kaur, H., Biswas, A., & Sen, S. (2017)**. A study of prevalence and socio-demographic profile of infertile couples in field practice area of a tertiary care centre, Amritsar, Punjab, India. *International Journal Of Community Medicine And Public Health*, *3*(6), 1472-1476

[22] **Ali S, Sophie R, Imam AM, et al. (2011).**Knowledge, perceptions and myths regarding infertility among selected adult population in Pakistan: a cross-sectional study. *BMC Public Health*. 2011;11:760.

[23] **Virtala A, Vilska S, Huttunen T, Kunttu K.(2011).** Childbearing, the desire to have children, and awareness about the impact of age on female fertility among Finnish university students. Eur J Contracept Reprod Health Care. 2011;16: 108–15.

[24] **Daniluk, J.C., Koert, E.(2013**). The other side of the fertility coin: acomparison of childless men's and women's knowledge of fertility and assisted reproductive technology. Fertil. Steril. 99(3), 839–846.

[25] **Garcia D, Vassena R, Prat A, Vernaeve V. (2016)**Increasing fertility knowledge and awareness by tailored education: a randomized controlled trial. Reprod BioMed Online. 2016;32:113–20.

[26] **Daniluk JC, Koert E.(2013).** The other side of the fertility coin: a comparison of childlessmen's and women's knowledge of fertility and assisted reproductive technology.Fertil Steril 2013;99:839–846.

[27] **Okonofua FE, Obi H (2009)** Specialized versus conventional treatment of infertility in Africa: time for a pragmatic approach. Afr J Reprod Health 13: 9-15.

[28] **Jimoh AAG (2004)**. The management of infertility. Nigerian medical practitioner46: 4-11.

[29] **Bunting L, Tsibulsky I, Boivin J**. Fertility knowledge and beliefs about fertility treatment: findings from the International Fertility Decision-making Study. Hum Reprod. 2013;28:385–97

[30] **Daniluk JC, Koert E. (2015)** Fertility awareness online: the efficacy of a fertility educationwebsite in increasing knowledge and changing fertility beliefs. Hum Reprod 2015;30:353–363.

[31] **Maeda E, Sugimori H, Nakamura F, Kobayashi Y, Green J, Suka M, Okamoto M,Boivin J, Saito H. (2015)**.A cross sectional study on fertility knowledge in Japan, measuredwith the Japanese version of Cardiff Fertility Knowledge Scale (CFKS-J).Reprod Health;12:10.

[32] **Daniluk JC, Koert E, (2012)** Cheung AP. Childless women's knowledge of fertility and assisted human reproduction: identifying the gaps. Fertil Steril;97:420–6.

[33] **Bretherick KL, Fairbrother N, Avila L, Harbord SH, Robinson WP. (2010).** Fertility andaging: do reproductive-aged Canadian women know what they need to know? Fertil Steril;93:2162–8.

[34] **Almeida-Santos, T., Melo, C., Macedo, A., & Moura-Ramos, M. (2017).** Are women and men well informed about fertility? Childbearing intentions, fertility knowledge and information-gathering sources in Portugal. *Reproductive health*, *14*(1), 91.

[35] **Chambers GM, Hoang VP, Illingworth PJ. (2013)**. Socioeconomic disparities in access to ART treatment and the differential impact of a policy that increasedconsumer costs. Hum Reprod 28: 3111-3117.

[36] **Quach S, Librach C(2008)**. Infertility knowledge and attitudes in urban high school stu- dents. Fertil Steril 2008;90:2099–2106.

[37] **Everywoman, J., (2013).** Cassandra's prophecy: why we need to tell the women of the future about age-related fertility declineand 'delayed' childbearing. Reprod. BioMed. Online 27 (1), 4–10(Jul 31).

[38] **Okwelogu, I. S., Azuike, E. C., Ikechebelu, J. I., & Nnebue, C. K. C. (2012).** In-Vitro Fertilization Practice: Awareness and Perceptions AmongWomen Attending Fertility Clinics in Okija, Anambra State, Nigeria. *Afrimedic Journal*, *3*(2), 5-10

[39] **Pedro, A. (2015)**. Coping with infertility: An explorative study of South African women's experiences.

[40] **Sackitey S. (2016)** Are women and sorcery only to blame for infertility in Africa.

[41] **Greil, A. L., Schmidt, L., & Peterson, B. (2014).** Understanding and treating the psychosocial consequences of infertility. In A. Wenzel (Ed.), The Oxford handbook of perinatal psychology (pp. 524-547). Oxford, England: Oxford University Press.

[42] **Nwajiaku LA, Mbachu II, Ikeako L. (2012)**. Prevalence, Clinical Pattern and Major Causes of Male Infertility in Nnewi, South East Nigeria: A Five YearReview. Afrimedic. J. 3(2):16-19.

[43] **Agarwal A, Mulgund A, Hamada A, Chyatte MR. (2015).** A unique view on male infertility around the globe. Reprod. Biol. Endocrinol. 13(1):37.

[44] **Greil AL, Slauson-Blevins K, McQuillan J.(2010)** The experience of infertility: a review of recent literature. Sociol Health Illn 2010;32:140–62.

[45] **Martins, M. V., Costa, P., Peterson, B. D., Costa, M. E., & Schmidt, L. (2014)**. Marital stability and repartnering: infertility-related stress trajectories of unsuccessful fertility treatment. *Fertility and sterility*, *102*(6), 1716-1722.

[46] **Ying, L-Y., Wu, L. H., & Loke, A. Y. (2015).** The experience of Chinese couples undergoing in vitro fertilization treatment: Perception of the treatment process and partner support. PLoS One, 10, e0139691.

[47] **Greil, AL., Schmidt, L., Peterson, BD.(2016).** Psychosocial and biological approaches to understanding and treating adjustment to infertility. In: Wenzel, A., editor. Oxford handbook of perinatal psychology. New York, NY: Oxford University Press; 2016. p. 524-547.

[48] **Takaki, J., Hibino, Y. (2014).** Family-related opinions and stressful situations associated with psychological distress in women undergoing infertility treatment. International Journal of Environmental Research and Public Health. 2014;11:9068–9081, DOI: https://doi.org/10.3390/ijerph110909068

[49] **Sazonova A, Kallen K, Thurin-Kjellberg A, Wennerholm UB, Bergh C. (2012).** Obstetric outcome in singletons after in vitro fertilization with cryopreserved/thawed embryos .Hum Reprod. 2012; 27(5):1343–50. Epub 2012/03/01. doi: 10.1093/humrep/des036 PMID: 22362926

[50] **Pasch LA, Gregorich SE, Katz PK, Millstein SG, Nachtigall RD, Bleil ME, Adler NE .(2012).** Psychological distress and in vitro fertilization outcome. Fertil Steril, 98 (2): 459-.

[51] **Karabulut A, Özkan S, O? guz N.(2013).;.** Predictors of fertility quality of life (FertiQoL) ininfertile women: analysis of confounding factors. Eur J Obstet Gynecol Reprod Biol 2013;170:193–7

[52] **Wu, A. K., Elliot, P., Katz, P. P., & Smith, J. F. (2013).** Time costs of fertility care: The hidden hardship of building a family. Fertility and Sterility, 99(7), 2025–2030.http://dx.doi.org/10.1016/j.fertnstert.2013.01.145.

[53] **Suzuki K, Hoshi K, Minai J, Yanaihara T, Takeda Y, Yamagata Z. (2006)** Analysis of national representative opinion surveys concerning gestational surrogacy in Japan. Eur J Obstet Gynecol Reprod Biol 2006; 126: 39-4.

[54] **Steward,R. G., Lan,L.,Shah,A.A.,Yeh, J. S.,Price, T.M.,Goldfarb, J.M., &Muasher, S. J. (2014)**.Oocyte number as a predictor for ovarian hyperstimulation syndrome and live birth: An analysis of 256,381 in vitro fertilization cycles. Fertility and Sterility, 101(4), 967–973. http://dx.doi.org/10.1016/j.fertnstert.2013.12.026.

[55] **Afshani, S. A., Abdoli, A. M., Hashempour, M., Baghbeheshti, M., & Zolfaghari, M. (2016).** The attitudes of infertile couples towards assisted reproductive techniques in Yazd, Iran: A cross sectional study in 2014. *International Journal of Reproductive BioMedicine*, *14*(12), 761.

[56] **Maheshwari A, Griffiths S, Bhattacharya S, 2011**. Global variations in the uptake of single embryo transfer. Hum Reprod Update 2011; 17: 107-120.

[57] **Sharma RS(2014).** Social, ethical, medical & legal aspects of surrogacy: an Indian scenario. Indian J Med Res 2014; 140 (Suppl.): 13-16.

[58] **Malhotra N, Shah D, Pai R, Pai HD, Bankar M (2013).** Assisted reproductive technology in India: A 3 year retrospective data analysis. J Hum Reprod Sci; 6: 235-240.

[59] **Meldrum DR (2017)** Introduction: Obesity and reproduction. Fertil Steril 107(4): 831-832.

[60] **Evaluation Research Team (2009)** Evaluation Briefs. Retrieved from http://www.cdc.gov/healthyyouth/evaluation/index.htm.

[61] **Bowman, J., Mogensen, L., Marsland, E., & Lannin, N. (2015).** The development, content validity and interrater reliability of the SMART Goal Evaluation Method: A standardised method for evaluating clinical goals. Australian occupational therapy journal, 62(6), 420-427.)

[62] **Pierce, L. L. (2010)**. How to choose and develop written educational materials. Rehabilitation Nursing, 35(3), 99-105.

[63] **Williams, A. M., Muir, K. W., & Rosdahl, J. A. (2016)**. Readability of patient education materials in ophthalmology: a single-institution study and systematic review. BMC ophthalmology, 16(1), 133.

[64] **Aldridge M. (2004).** Writing and designing readable patient education materials. Nephrology Nursing Journal, 31(4), 373–377.

[65] **Rosdahl JA, Swamy L, Stinnett S, et al. (2014)**. Patient education preferences in ophthalmic care. Patient Prefer Adherence. 2014; 8:565–74.