Assisted reproduction; religious perspectives

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Structured abstract

Introduction:

The birth of Louise Brown, known for being the first human to have been born after conception by in vitro fertilization [IVF], caused the emergence of a new field in treatment of infertility, i.e. the opportunity for millions of couples around the world to have a baby.

Due to the supply of new methods such as gamete donation, surrogacy, etc., moral challenges as well as religious approaches were formed in this regard.

Aims:

Emphasizing the importance of pregnancy and reproduction in different religions and religious tendencies, both for those who request these services and for those who provide them, has caused problems for decision-making in this field. This article has been written with the aim of examining the views of religions on this issue.

Results:

A comparative study of different religions about each method of assisted reproduction with similarities and differences in the views of religions in these cases and its role to help decision-making followers of each

Discussion:

It seems that the greatest emphasis of religions is on preserving human dignity, and there is strictness, especially regarding the use of the third person in most religions. However, with the spread of modernity, the role of religious beliefs has diminished.

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Introduction:

Family relations has been of the main concerns in all religions, with special respect and sanctity considered for its formation and preservation. One of the issues on family relations is child-bearing and the survival of generations that has been emphasized since the time of Noah; GOD ordered him "GOD blessed Noah and his sons and ordered them: fertilize and grow and fill the earth." [1]This issue is that much important that in some religions, such as Judaism, child-bearing is considered as one of the main goals for family formation and women and men are...
encouraged to marry to have children [2] Family relation and child bearing are also emphasized both in Quran and Sharia [3] Christianity also emphasized child-bearing as the result of marriage and accredit child production only through married couples' intercourse [4] so that in some Catholic Christian branches, sexual intercourse is permitted only for the purpose of child-bearing.

In addition, there are similar stories about infertility and inability in child-bearing in religions which indicate that this has long been an important issue for the couples and society. For example, the Old Testament cites the infertility of Rachael, Jacob's wife, and stories of Sarah and Rika who suffered infertility [1], [5]. Or the story of Mary, who was fertilized without intercourse, indicating a particular type of fertility.

Weird methods of getting pregnant are also mentioned in some religions; such as those told in narrations in Hinduism, pointing out a woman's pregnancy by a man other than her husband or a surrogate mother [6]

Child-bearing and infertility have been considered as one of the major problems in medicine, and a cultural and religious controversy.

It is estimated, according to the results of a study, that about 48.5 million couples will have problems in having a child in 2010 all over the world [7]. It demonstrates the numbers of couples [97 millions] who have trouble in getting pregnant, proving the importance and expanded rate of infertility. Therefore, medical science has always been seeking for solutions.

Louise Brown, the first child born by artificial fertilization, was born on 25 July 1978 and proved the fascinating reality of the possibility of getting pregnant through methods that were previously unimaginable, causing a new attitude toward infertility in the world.

Assisted reproductive technologies [ART] grew rapidly in the world, making millions of infertile couples hopeful to have a child. These new methods emerged some challenging debates in medical ethics, religious jurisprudence and also social norms. Besides treating infertility, new methods opened the door to some diagnostic technologies such as pre-implantation genetic screening that made a new wave in efforts to improve healthy childbearing. Using frozen embryos, the sperms of a deceased husband, the egg of an aborted embryo, etc. are some of these challenges.

In this regard, this article first examines the differences of various methods in treatment of infertility in terms of prerequisites and techniques, and uses, and on the other hand, we did a comparative study on different religions opinions on accepting or rejecting any of these treatment methods.

Assisted Reproductive Technology

Before discussing the attitudes of different religions on the assisted reproductive technologies, it is necessary to provide a brief definition of these techniques based on the Glossary of the International Committee Monitoring Assisted Reproductive Technologies [ICMART] and the WHO glossary in 2009. Assisted Reproductive Technologies [ART] are methods and techniques that help the infertile couples or those with known or unknown causes in fertility to get pregnant, and include:
1. **Intra Uterine Insemination (IUI)**

In IUI, the sperm collected from the partner and processed in the laboratory is placed into the uterine cavity by a long needle-like device called a catheter. It is normally used when there is a barrier for sperm to reach the fallopian tubes. The partner's sperm or that of donor can be used in this technique [8].

2. **In Vitro Fertilization (IVF)**

IVF, as the oldest form of ART, is a process of fertilization where an egg is combined with sperm outside the body, in vitro. The process involves monitoring and stimulating a woman's ovulatory process, removing an ovum from the woman's ovaries and letting sperm fertilize them. After the fertilized egg, it is implanted in uterus [9].

3. **Intra Cytoplasmic Sperm Injection (ICSI)**

It is a technique in which a single sperm is picked up with a fine needle and injected directly into egg, this method will be used in cases where the number of sperms are too few [9, 10].

4. **Gamete Intrafallopian Transfer (GIFT)**

Like IVF, this process involves retrieving an egg from the woman, combining with sperm in a lab then transferring back to her body, but in GIFT the process goes more quickly. A sufficient number of sperm and egg are implanted by the laparoscope directly into the fallopian tubes that the natural place of fertilization. This process needs normal fallopian tubes [9].

5. **Zygote Intra Fallopian Transfer (ZIFT)**

It is one of assisted reproductive technologies, which is a combination of IVF and GIFT. In this process, after extra corporal fertilization the zygots will transfer to the fallopian tube through a laparoscopic procedure. [9]

The above mentioned technologies can be done either by the infertile couple’s gametes or donation. It means that these techniques do not necessarily require a third party or donated cell.

6. **Ovum Donation**

Despite of normal reproductive organs, some women are infertile because of the lack of ovum, due to old age, early menopause and other disorders such as ovarian disease. In such cases, zygote can be formed by fertilization of a donated egg and the partner’s sperm [9].

7. **Sperm Donation**

In some cases, the husband have not sperm which called azoospermia in medical terms, this condition can be congenital or caused by some diseases. Therefore, the woman’s egg should be fertilized by a donated sperm to form the embryo [9].

8. **Surrogacy**
In some cases, couples have no problem in producing ovum or sperm and embryo can be formed but, the problem is in mothers uterus therefore the development process of embryo in mother's womb would be impossible; in this situations , the embryo will transfer to another woman's womb and she gives birth to the child for the infertile couples [9]

9. Pre-implantation Genetic Diagnosis [PGD]

Pre-implantation Genetic Diagnosis [PGD] is the genetic profiling of embryo prior to implantation and is used to prevent genetic disease. It consists of techniques to identify various genetic abnormalities and requires IVF to obtain oocytes or embryos for evaluation. The biopsy performed in day 3 or 5 after fertilization. Then, normal embryos will transfer to the mother's womb [9]

10. Embryo reduction

Multiple pregnancies are one of the side effects of infertility treatment methods, which are caused by ovarian stimulation or the transfer of more embryos to achieve higher success in pregnancy. To Solving the problem and its consequences, the implantation rate of embryos could be decreased to prevent fetal and maternal complications; to select embryos in cases where one or more embryos have chromosomal or other abnormalities, or to determine the fetal sex [[9], [11]].

The PGD and embryo reduction itself are not infertility treatments but they are techniques witch are possible due to our development in ARTs.

The different religions opinion on ARTs

This comparative study was conducted based on Bereday's model. The four steps in this model are description, interpretation, juxtaposition, and comparison. In this regard, the attitudes of each religion on assisted reproductive technologies were first explained and then, according to their most important theological foundations, were interpreted and finally, their official opinion presented.

The order of representation is based on the number of the religion’s followers.

Table 1

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<th>Religions</th>
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Demographic projection_"The Changing Global Religious Landscape"

**Christianity**

According to the Pew Research Center report in 2005, about 2,300,000,000 people [31.2%] of the world population are the followers of Christianity, which is known as the largest religious group in the world [12]. The growth of Christian population is most in Europe, America, North Asia and Oceania with about 50% Catholic, 37% Protestant, and 12% Orthodox [13]. Other Christian groups, which include the remaining 1%, are the members of The Church of Jesus Christ of Latter Day Saint [Mormons], Jehovah’s Witnesses, and Christian Science Church.

**Catholic Church**

In Christianity, family is of great importance and in some branches such as Catholic, this importance is so high that divorce is prohibited [6]. In most branches of Christianity, childbirth and fertility are recognized only in the family and other ways of childbearing are regarded as interference in GOD's will. There are three principles in Catholic Church on marriage and childbearing, which are very important and documented as: a) protecting human being from the conception, b) the child is the result of marriage and could be created only through the intercourse of couples, and c) the integrity of human sexuality, which requires that conception take place through sexual intercourse. [4] In 1956, Pope Pius XII, declared, in a speech, artificial fertilization illegal and immoral due to separation of childbirth and normal sexual action [14]. In this context, Pope John XII also declared in 1961 that "human life in transferred through family and the family is formed by marriage" and that "he [human] is not permitted to use the methods and tools for plant and animal production" [15]. Therefore, it can be inferred that all forms of assisted reproductive technologies, including IVF, IUI, ICSI, ET, and surrogate mothers are not allowed by Catholic Church, except for IUI, if the sperm is obtained from the husband through intercourse. According to Catholic Church, life is a precious gift from the Lord and must be treated with the utmost respect not as a means or good to earn skills [16]. Based on the attitudes of the followers of the Catholic, who regard human value for the fetus from the moment of conception, any manipulation of the embryo, including sex determination, pre-implantation genetic diagnosis [PGD], and abortion is not allowed.

**Protestant Church**

The leaders of the Protestant Church, have more slight attitudes toward the assisted reproductive technologies. The Protestant bioethics are based on needs and respect for different ideas and human being's autonomy as well as one's responsibility for her/his actions, and hence, if there is any need to use the assisted reproductive technologies, it is permitted [17]. The fetus, to the most Protestant leaders, has no human value or dignity for 14 days after conception [18]. The Protestant followers believe that IVF is permitted if the ovum and sperm obtained from the married couple and the embryo implanted in the same woman's uterus. Surrogacy and sperm or ovum donation is not
allowed, and the genetic diagnostic measures before pregnancy are permitted only in order to parents be prepare for developing a child with a genetic disorder or disability because the child, in Christianity, is a fruit granted by the Lord and human has no right to destroy it [5]. In this sense, using PGD for sex determination and selection is prohibited.

Other branches of Christianity

The Orthodox Church, the Eastern Roman Church, and the Church of Jesus Christ of Latter-day Saints [Mormons], Jehovah's Witnesses, the Christian Science Church, and Anglican Church also have more flexible views than the Catholic Church about using the different assisted reproductive technologies, and ART in general. According to Anglican Church, the masturbation is allowed for obtaining sperms in IVF and even in some cases, the use of a third person's gamete is permitted [5]. However, there are concerns about using these techniques for single women and homosexuals [19].

Though the Eastern [Greek] Orthodox is not as strict as Vatican in using the ART, it does not allow for IVF. However, IUI is permitted only if using the husband’s sperm. However, This Church recommends the infertile couples to adapt a child instead of using the ART [20].

In The Coptic Orthodox According to the latest comments of Bishop Gregorius, IVF is permitted only if ovum and sperm obtained from the married couple and the embryo transfer to the same woman's uterus. Gamete donation and surrogacy are not allowed [16].

Other followers of Christianity do not have specific direction on using the ART and, from the bioethical point of view, the decision-making responsibility is ultimately left to the person to make decisions based on his/her conditions and needs. It should be noted that the Christian Scientists Church believes that it is better not to use IVF as far as possible due to the involved surgical procedures and medical and technical interventions [5]. In general, all branches of Christianity emphasis that the ARTs only can be used for a married couple. Clearly, the difference in attitudes largely depends on the notion that the fetus is considered as a human and have the right to live based on the stage of her/his development in which the fetus gain moral status.

Islam

According to The Pew Research Center, Islam, with about 1 billion and 800 million [24.1%] followers was the second largest religious group in the world [13]. The geographical spread of Islam in the world is largely in Asia, Africa, Europe, and to some extent in the Far East, and also is expanding in northern Europe [21].

Considering the Islam’s guidance on marriage and childbearing, it can be understood that reproduction is of great importance in Islam as mentioned in the Quran; verse 12 of Nouh sûrah, verse 69 of The At-Tawbah sûrah [22].

Moreover, the stages of morphological development of the fetus are described in a very scientific and specific manner in the Quran. The embryonic stages developmental are described in verses 12 to 14 in The Believers Surah under the terms "nutfa", "alaqa", and "mudgha". According to this verse, the time of organ differentiation is 42 days.
after fertilization [17], [23] According to the results of the international seminar on "Dilemma in Stem Cell Research" hold in Cairo in 2007, most Sunni and Shiite scholars agreed that the fertilized egg is not alive before 14 days after fertilization and hence, conducting research in this period is allowed only for humanitarian benefit [17]. Most Muslim scholars and jurisprudents believe that ensoulment happens about 120 days after fertilization and the fetus can be recognized as a person after this time, and therefore, abortion after this time is not allowed [24] What is of great importance in Islam is inheritance and Nasab [filialion] that are passed from the father to the child. The children's religion, in Islam, is also the same as the father's. According to Islamic rules, every child has the same religion as his/her physiological father [sperm owner] and inherits from him [25]

The jurists and scholars of the two major Sunni and Shia branches have different views, in some cases, on using the assisted reproductive technologies. Here, these views are studied:

Sunni

Sunni Islam is the largest denomination of Islam, followed by 87-90% of the world's Muslims. The followers of this branch follow the fatwas given by jurists in religious centers generally located in the Al-Azhar University in Egypt or "the Islamic Council of Jurisprudence in Mecca". The first fatwa in the world of Islam on medical reproduction was issued by Sheikh Azam of the Al-Azhar University on March 23, 1980, just two years after the birth of first IVF baby in the UK, and six years later, the first IVF clinics were established in Egypt, Saudi Arabia, and Jordan [26] This fatwa became the source for the subsequent fatwas on this matter, including the fatwa issued by the Islamic council of jurisprudence in Mecca in 1984. In addition, two other guidelines were issued in this regard: 1) the guidelines of the Islamic Medical Organization based in Kuwait in 1991 and 2) the guidelines of the Islamic Educational, Scientific, and Cultural Organization issued in Rabat, Morocco in 2002 [5]

The common point in these fatwas, which is accepted by Sunni jurists, is that assisted reproductive technologies, including IVF, are allowed only if the gametes of a married couple will be used. In principle, only the husband's sperm can be used to fertilize the wife's ovum. This is based on two important Sunni beliefs. First is "Nasab" that refers to the genetic relationship of the child to his/her genetic father and includes important issues such as Mahramiyat [a mahram is an unmarriageable kin with whom marriage or sexual intercourse would be considered haram [illegal] in Islam], inheritance, and guardianship. Second is the issue of unlawful sexual intercourse or "Zina". According to Sunni jurists, any combination of the male and female gametes in any other way other than a married couple’s intercourse or touch is considered haram and as Zina, this means that using a third party’s gamete in the production of a child in any way is prohibited. Another problematic issue, to Sunni jurists, in the use of a third party in assisted reproductive technologies is the probability of marriage of the child resulting from these techniques to his/her half siblings; it is considered as Zina, too [26], [27]

According to Sunni beliefs, the transfer of the embryo resulting from the combination of gametes of a married couple is allowed only to the same woman's uterus, and therefore, they are against surrogacy. The interesting note is that the transfer of the remained embryos resulting from assisted reproductive technologies to the same woman's uterus is permitted only if the couples are yet formally married [5]

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Since adaptation is not accepted among the people in the Middle East and, in particular, Muslims, and in some Sunni fatwas, it is prohibited [26], infertile couples are increasingly so interested in using the assisted reproductive technologies that infertility treatment clinics have rapidly developed in these countries especially in Egypt, Saudi Arabia, Jordan, Morocco, etc.

Clinics for infertility treatment, in other Muslim countries such as Turkey where most Muslims are Sunni, are rapidly developed and supported by the government but they are more under the control of secular rules than religious rules [28]. It, however, does not refer to the violation of the religious rules in these clinics but rather shows the permission of some processes such as using a third party's gamete by the government. There are severe restrictions on extramarital couples who request for infertility treatment services, such as single women and homosexuals [29].

Another important issue in the IVF process is the method of sperm collection. In Islam, masturbation is haram and therefore, using this method for sperm collection in the infertility treatment clinics is prohibited. Hence, the methods of withdrawing during intercourse are rather used [30].

Sunni Muslims are permitted to use the remained embryos and freeze them to be used in the future, but there are special rules on using PGD techniques [20].

It is also permitted to decrease the number of embryos in the uterus if the destruction of one results in surviving the other embryos or in conditions, such as multiple pregnancies, that is life-threatening for the mother [26]. Regarding sex determination, there is a prohibition on sex determination for the first child by PGD techniques. However, based on the latest fatwa by the Mufti of Al-Azhar University, PGD can be used to determine the sex of the third child of a family if the other two are of the same sex [5].

Shia

The countries with the most Shia population are Iran, Iraq, Afghanistan, Lebanon, and some newly independent countries in the Soviet Union. Iran is currently one of the leading Muslim countries in the assisted reproductive technologies. The first Iranian infants produced by IVF technique were twins who were born in Aban Hospital in Tehran on December 27, 1991 [31]. and since then, using infertility treatment methods in Iran has been so expanded that more than 80 private and public clinics serve people by these techniques. In Beirut, Lebanon, clinics are established with the same rules and procedures as those in Iran to treat infertile couples [27]. Among Shiites, ovum donation, IVF, PGD, and even Surrogacy, according to fatwas by most jurists and scholars of this branch, are permitted. Recognition of the assisted reproductive technologies in Iran is so approved that the "Embryo Donation" Act was passed by Parlement in 2005 and declared the assisted reproductive technologies lawful [6]. This act included conditions on legal marriage of the owners of gametes, their health and the absence of incurable disease. But there is no condition on the number of donated embryos or the number of embryo-recipient couples from a fertile couple [32]. Considering the provisions of this Act, it is revealed that donating embryo to the homosexual, bisexual, and transgendered groups is not accepted in Iran and especially in Shia [33]. According to this Act, the couple can request for embryo donation even if only one of them is infertile.
Shiite jurists and scholars have contradictory ideas in some cases. For example, regarding the question who is the mother of the child resulted from the assisted reproductive technologies, Ayatollah Khuei answered in 1992, based on a verse from the Quran, that the woman who gives birth to the child is the mother of that child [6]. While most Shiite scholars and jurists regard the gamete owner as the biological mother of the child. Another basic difference between Sunni and Shia beliefs is sperm donation that is permitted by Ayatollah Khamenei's fatwa in 1999, based on which it issued permitted [17]. Now, due to changes in population policies in Shiite countries, families are more encouraged to have children, which can provide more government support in this matter, although the studies have showed an increasing trend in having only one child or no child[34].

What is of importance about sperm donation is that though, in Shia, the donor and recipient couples are considered as the child's parents [social parents] and is registered in the National Organization for Civil Registration under the name of the recipient couples, the child inherits form the sperm owner, not from his/her social father [whose name is recorder in the child's birth certificate] [26]. This problem is supposed to occur in the case of the death of the social father or if the child resulted from the donated embryo is going to marry one of his/her siblings [35].

Recently, the Iranian National Organization for Civil Registration has attempted to solve this problem and hence, it is recorded in the remark page of the ID certificate of the child that s/he is the result of the donated embryo. However, the privacy issues may be ethically problematic if the child has access to his/her ID certificate before the age of 18 or delivering it to school and other centers. The other important discussion in Islam is Nasab, which determined the purity of genealogy but donation of a gamete can alter the family's genetic reserve. Some couples prefer to receive a donated gamete from their close relatives, such as their siblings, to maintain their family lineage and prevent inclusion of any other genes in their family [36].

Another issue on sperm donation is whether the donor of sperm is mahram to the ovum owner or whether the resulted embryo is legitimate. According to Islamic law, sexual intercourse is only permitted for the married couple and any sexual relation of a married woman with another man other than her husband is haram [Zina]. The donated ovum is generally obtained from an unmarried woman and the sperm owner becomes mahram with that woman through "temporary marriage [mut'a], legitimating the resulted embryo. Regarding fertilization of a married woman's egg and donated sperm, Ayatollah Khamenei believes that it is performed out of the body [in vitro] and hence, it does not considered as Zina [37].

Despite this fatwa, it is proved, based on the statistical studies, that the ovum donation and surrogacy, due to cultural, customary, and social conditions, are more popular than sperm donation in Iran [28].

Some Infertility treatment clinics in other countries with Shiite populations conduct their activity based on the Iranian Shiite jurists on permissibility of sperm donation [38].

Advances in the assisted reproductive technologies have caused modern issues in this matter, like fertility by sperm of a deceased husband. The operation was first reported in 1997 in England where Mrs. Blood request obtaining sperm from her deceased husband who was brain dead. Due to opposition of British court, she had to do it in Belgium. She gave birth to her son after a successful IVF. The deceased husband's sperm can be used in three ways: 1. using the frozen sperm; 2. using the deceased husband's sperm immediately after his death or brain death; and 3. using the frozen embryos formed by his sperm and his wife's ovum. According to some Shiite jurists such as...
Ayatollah Sayyid Muhammad Hussein Fazlollah, Sayyid Muhammad Hussein Shirazi, and Sayyid Muhammad Saied Tabatabaei Hakim, the couple's relationship is terminated with the death of husband and insemination by his sperm is haram. Most Sunni jurists have the same belief. However, some other Shiite jurists such as Ayatollah Sanei, Ayatollah Muhammed Taghi Ja'fari, and Ayatollah Fazel Lankarani permit, the transfer of the husband's sperm to his wife's uterus after his death based on the concept of "waiting term of death" Iddah [39].

PGD techniques, sex determination and embryo reduction are permissible in Shia Surrogacy is also permitted but the main question is whether the surrogate mother and the born male child are mahram. Since she is not his biological mother and, according to Islamic rules, they are non-mahram. In this regard, in Shia and based on religious rules, the solution is in employing a wet nurse who breast feeds another's child and is considered to be the child's biological mother and mahram to the male child [28]. In some cases where the surrogate mother delivers the baby to the gamete owners without breast feeding it, it can be inferred, based on the philosophy of breast feeding [Reza'] and its sanctity, that the fetus has been feeding and developing for 9 months of pregnancy. The baby's flesh, blood and bones are made from the surrogate mother's blood and hence, the baby is considered as her child, too [40].

Hinduism

According to the reports released in 2015 by The Pew Research Center, the third largest population group in the world is unaffiliated, followed by Hinduism with 1.1 billion followers who consists 15.1% of the world's total population [13].

Children, in the culture and religion of Hinduism, have a special position and value in the family relations and concepts and there are many stories on attempt to cure infertility. For example, in a story by Sage Agastya, one of the greatest epics of Mahabharata [one of the two great heroes of Hindu Sanskrit culture since 400 AD], he asks "who cares for me in old age?", referring to the role of children in this culture and religion. According to religious beliefs, every believer should produce a child every year for Shraadha [compulsory gifts to ancestors] so that the ancestors can be nourished at their living place; otherwise, they will suffer from hunger and thirst [6]. Based on the sacred texts of Hinduism, if a man is unable to have a child, his wife can ask another man with the same rank and status to help her to have a baby, and the baby belongs to the woman and her husband and that man has no right to the baby [41]. Moreover, the story of Mahabharata says that when King Vichitravirya died, his mother asked Sage Vyasa to marry with her widowed daughter and the babies were considered to be Vichitravirya's [legal father] children. According to the stories of the sacred texts, it seems that the infertile couples are allowed to use another's gamete though sperm from their relatives or a person with the same status is preferred. Regarding the surrogacy, a story in Bhagavata Puranadis about King Kasma who was informed of his nephew's [Devaki] decision to kill him. So, the King ordered to imprison Devaki and his wife, Vasudeva, and kill their 6 children. Then, Gods transferred the 7th baby from his wife's uterus to his another wife's [Rohini] uterus [6]. What is important on childbearing in Hinduism is that it is of great sanctity and mainly distinct from sexual pleasure. In general, there is no specific ban on using the assisted reproductive technologies in Hinduism and hence, India can be a suitable destination for the infertile couples even for homosexuals and LBGT [lesbian, bisexual, gay, and transgender]. The only case that is forbidden in this religion is abortion, which caused challenges for the PGD process [5].

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Buddhism

Buddhism beliefs with followers in Eastern Asia such as Malaysia, Indonesia, and Thailand, is very similar to Hinduism. All the assisted reproductive technologies are permitted in this religion and there is no difference between the baby produced by IVF and that formed by natural pregnancy. The babies born as a result of the donated gamete have rights to know their biological parents after reaching the maturity age. Due to high value of life and belief in dignity of the embryo from its formation, abortion is forbidden in Buddhism. However, decrease in the number of embryos to survive the other embryos is accepted. In order to prevent the birth of a baby with physical problems, PGD is accepted as an effective method in this regard. Nevertheless, any attempt to create a perfect child is considered as interference in the nature and hence, is rejected [5] [42]

Judaism

Judaism is the first and the oldest monotheistic religion [the Abrahamic religions] with a Holy Book. 10 million people, about 0.02% of the world population, around the world consist their followers, who live in the north America, Middle East, Europe and Australia [13]. According to Judaism, GOD's first order to Adam, after his creation, was "to grow and multiply" [Genesis, 1:28]. This order has been interpreted as a commitment to reproduce, therefore, based on this order forming a family and having children seen mandatory [43]. The main source of Jewish laws are Torah as a written source and Mishen, Talmud, Post-Talmud Codes, and Responsa as the Jewish verbal tradition

The Jews, now, are divided in three major sects: 1] Orthodox Jews who are strict in observing the religious rules and included 10% of the Jewish population. 2] Conservative Jews, who consist 5% of the population, and 3] the Reformist Judaism, about 85% of the population, who are not as religious as the followers of the other two sects and act mostly based on secular biological ethics [5]. The assisted reproductive technology is permitted in Judaism if it is performed to 1] multiply the Jewish population, 2] consider the ethics and kindness, and 3] maintain the integrity of the family [4]. Israel is one of the leading countries in using the assisted reproductive technologies and the first baby born as the result of IVF in 1982 was the fifth IVF baby in the world. The infertility treatment clinics were quickly established and supported by the government in this country and every Israeli woman between the ages of 18 to 45 years old, regardless of sexual orientation, could use the insurance benefits twice for the assisted reproductive technologies [2]. However sperm collection is prohibited through other methods than natural, including masturbation or using special condoms. Nevertheless, in the 20th century, some Jewish rabbis such as Rabbi Moshe Tendler and the late Rabbi Moshe Feinstein have expressed more moderate views and considered the issue of sperm donation as a personal issue [5]. There is no rigidity on using sperm of a non-Jewish man and since Orthodox Jews are afraid of the combination of a Jewish man's sperm with a married woman's egg, due to similarity with incest, they prefer using sperm of a non-Jewish man and therefore, there is a sperm bank, called as Kibbutz, in the hospitals around Israel, which reserves sperm of non-Jewish men [2, 44]. The Orthodox Jewish couples who are most religious prefer using the clinics with a supervisor who controls the conformity of Halakha-based religious rules and the applied methods in IVF [6]. Regarding ovum donation, the case is different in Judaism since, according to the religious rules, a child acquire his/her religious views of the mother [unlike the other religions in which the religion
is passed from the father to the child); in this regard, it is preferred to avoid ovum from a non-Jewish woman in childbearing as much as possible. Rather, using Jewish women's ovum is accepted to expand the Judaism. According to some Jewish Rabbis who believe that religion is passed from the mother to the child, there are strict rules on non-Jewish surrogate mother to carry a Jewish couple's embryo. But in a lawsuit filed in 1991 by Rutty against her husband Danny [an Israeli infertile couple]; the husband withdrew his consent, while flying to America, for transferring embryo fertilized from his sperm and his wife's ovum to an American woman's uterus. This lawsuit led to the enactment of the act of transferring the embryo to another woman's uterus in 1996 in Israel where is considered as the first country with this Act. It should be noted that this Act applies only to heterosexual couples [2].

In terms of religious rules, some Rabbis prefer single Jewish women for surrogacy to other Jewish women, due to reduced probability of combination of a Jewish man's sperm and a Jewish married woman's ovum [incest] and to pass the Judaism by the mother to the child [5]. There is no prohibition on using PGD techniques in Judaism because the Jewish people believe that the embryo gains a human soul 40 days after conception, permitting diagnostic procedures on the fetus before this time. There are restrictions, however, on using sex determination methods and it is permitted only for determining the 5th child if the other 4 children have the same sex [5]. The destruction of extra embryos resulted from the assisted reproductive technologies should be spontaneous and deliberate destruction is prohibited. The assisted reproductive technologies for the homosexuals and single women in Israel are permitted [28]. Regarding the transfer of the deceased man's sperm [in the case of the husband's death, or patients under chemotherapy or divorce], sperm, with prior consent, can be transferred to the wife's uterus [30].

In Asia, there are three important religions that have bioethical principles, including Shinto, Confucius, and Zoroastrianism.

Zoroastrianism

According to the Federation of Zoroastrian Associations of North America, this religion had 137,000 followers in 2012, living in Iran, India, Azerbaijan, Afghanistan as well as Australia, and the United States [45]. Zoroastrianism is the first and oldest monotheistic religion in the world, rooted in Iran formed under the teachings of Zoroaster. Bioethical matters are of great importance in Zoroastrianism and there are special instructions on their different aspects. In Zoroastrianism, men and women are encouraged to have children, but not in large number, and that is why most Zoroastrian families have only one child. Ovum donation is accepted in this religion and there is no prohibition on embryo donation. However, using a third person in transferring embryo is less acceptable, due to blood combination [46]. Regarding sperm donation, there can be found Zoroastrian ancient stories about the birth of baby after the death of the father; therefore, it can be assumed that sperm donation is not prohibited in Zoroastrianism [47].

In this religion, the baby born as a result of gamete donation belongs to the recipient couple and the gamete owner has no right over the baby. Moreover, based on cultural differences between the followers in the world and due to geographical location, revealing the third party involved in producing the child resulted from the assisted reproductive technologies is different, as Argentinians and Europeans tend more to disclose it [46].
Shinto

Shinto is one of the oldest religions originating from Japan and means "Gods' path" and is very similar to the Buddhism. Shinto was originally a Japanese primitive belief that dates back to the Jomon period and Yayoi and Showa era [1926-1989] [48]. The family foundation is emphasized in this religion. This religion has no sacred book, unlike the other monotheistic religions. The Japanese people's culture has been influenced by Western culture in the recent decades and part of its bioethics has been faded among the Japanese people. All the assisted reproductive technologies are permitted in Shinto. However, ovum donation and surrogacy are prohibited but there is no prohibition on sperm donation; the first sperm bank was established in 1965 in Japan. PGD is accepted in Japan only to prevent genetic diseases; it is prohibited for sex determination. Nevertheless, the request for changing this rule is rising. In Japan, IVF is prohibited for HIV positive couples [5, 49].

Confucius

Confucius is the most famous philosopher in ancient China, who lived in China about 500 years before the Christ. According to the Confucianism, the soul is located in the human body after birth and the embryo is not of the same position as human but it is not permitted to kill the fetus due to sanctity of life [50]. In this sense, studies on the embryo and PGD are not permitted except for medical indications. Sex determination is permitted, only in special medical cases and sex-related diseases. The unity of soul and body is emphasized in the Confucianism and hence, there are special rules on surrogacy and embryo donation and using the surrogate mother are not permitted in this religion [51]. In addition, family is recognized by the marriage of two heterosexuals, and LBGTs are not permitted to ask for the assisted reproductive technologies [52].

Conclusion

The summary of discussed issues are presented in Table 2.

As we can see in this comparative study, using assisted reproductive technologies for infertility treatment varies based on the teachings of each religion. However, some fundamental issues are mentioned in all religions equally such as preservation of human dignity and the importance of child bearing in a family. Some religions will not accept the role of third parties in infertility treatment and the others did not accept some diagnostic approaches like PGD and sex selection because of their consequences such as abortion. However it seems that widespread communication and the phenomenon of globalization influence the role of religion in personal life and fertility decisions, an important issue that must be mentioned by religious leaders.

Table 2 – Religions Position on Infertility Treatment

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Conflict of Interest:

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<th>Religion</th>
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<th>Eastern Roman Church</th>
<th>Coptic Church</th>
<th>Sunni Islam</th>
<th>Undetermined</th>
<th>Shia Islam</th>
<th>Hinduism</th>
<th>Buddhism</th>
<th>Zoroastrianism</th>
<th>Shinto</th>
<th>Shinto With prior consent</th>
<th>Confucius</th>
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<th>Ambiguous</th>
<th>Judaism</th>
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