Journal of Religion and Health (2021) 60:663–683
https://doi.org/10.1007/s10943-020-01018-3

PHILOSOPHICAL EXPLORATION

The Beginning of Life Issues: An Islamic Perspective

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Published online: 22 April 2020

Abstract
Islam gives legal precedence to purity of lineage and known parenthood of all children. In Islam treatment to infertility using IVF is permitted within validity of marriage contract with no genes mixing. The paper shows that the Qur'ān, the word of Allah, and science, the deeds of Allah are not in major conflicts in defining the start of human life. The Holy Qur'ān provides an elegant description of origin, developmental stages of intra-uterine life. The Hadith explains two positions one that believes human embryo get ensouled at conception and the other after 40 days of conception. The paper aims to find that Islam confers moral respect to human embryo, but it also clarifies the absence of full human rights to a developing foetus. In Islam, human embryonic use is probably permissible for therapeutic and reproductive purpose keeping intact the principles of Shari'ah.

Keywords Embryo research · Islam · Preservation of posterity · Assisted reproduction · Religious perspective · Shar'iah

Introduction

The desire to beget one's own offspring is a very strong instinct. The holy book of Muslims, the Quran, endorses the fact that wealth and children are the adornments of the world. The lord rewards the good deeds. The lord also grants the wishes of begetting of progeny of some couples, and there would be some who would remain infertile. The Quran mentions, 'He creates what He wills. He bestows male or female children (to some) and He leaves barren whom He wills' (Ali 1987, Chapter 42, Sura/verse 49–50). So it may be assumed that infertility is viewed as an important obstacle and treating of this hardship is not viewed as a defiance of God's will. In fact, the Holy Qurán mentions that Islam intends ease (Yusr) and not hardship or difficulties (Usr) (Ali 1987, chapter: Al Bakara or The Heifer, 2:185). The basic tenet

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of Islam permits people to overcome hardship within lawful means, keeping their trust in their Lord or Allah, who they believe would help them in achieving their goals and overcome their hurdles. The Broad Principles of Islamic Jurisprudence are permissibility unless forbidden by a ruling as mentioned in the text, Asalat al-Ibaha (primacy of permission)[1] (Esposito 2003).

It is necessity which allows the choice of the lesser harm. According to Shariaáh or Islamic laws,[2] (Hallaq 2004, 2009) marriage, family formation and procreation hold importance. And if infertility for married Muslim couples be viewed as impediments or disease, then Shariáh instructs or encourages them to seek cure within the permissible limits of the law. So by Islamic laws, treatment of infertility is a perfectly legitimate pursuit provided that the beneficial effect of having children by infertile couples outweighs and does not have any harmful effect on the resulting child and society as a whole.

Religion and medicine are equally involved when we face beginning-of-life issues such as sanctity of life, dignity, procreation, fertilization, abortion and birth. Though there seems to be a partition between religion and technology, proper medical awareness and scientific knowledge would put to rest the opposition holding between them (Mitra 2017). For those uninitiated, in the definition of the beginning of life, embryo forms the crux of the discussion. The paper seeks to show the Islamic position that a full human right is not conferred to a developing embryo till being viable and born alive, yet it does not justify unacceptable tampering with the developing foetus. The paper discusses derivation of Islamic ruling on family formation and how medical intervention in human reproduction can do away with infertility problem within the framework of marriage.

Islamic Bioethics and Reproductive Technologies

Islam signifies submission to the God's or Allah's will, obeying His commands and abstaining from what He prohibited. The permissible and prohibited actions are embodied in the Islamic law or Shariáh. Shariáh are derived from Quran, the infallible word of the Prophet preserved over the centuries as His Sunnah.[3] If there are some legal affairs which could not be governed or covered by the above legal source, then they are to be determined by a legal reasoning procedure called Ijtihad

[1] 'Ibaha' is used in fiqh (jurisprudence) as a permission of possessing or utilising something. Ibaha means to allow. Majority of Shiá faqihs believe that both Shar' and' Aql (religion and reason) prove asalat al-Ibaha (primacy of permission). Such opinions find mention in the verses of the Holy Quran Sura al-Baquara, verse no. 29 and verse no. 168. Sura al-Anám, verse no. 145.

[2] Shariáh: Islamic canonical law based on the teachings of the Holy Quran and the traditions of the Prophet (Hadith and Sunnah), prescribing both religious and secular duties and sometimes retributive penalties for law breaking. It has generally been supplemented by legislation adapted to the conditions of the day, though the manner in which it should be applied in modern states is a subject of dispute between Muslim traditionalists and reformists.

[3] Sunnah is the verbally transmitted record of the teachings, deeds and sayings, silent permissions or disapprovals of the Prophet Mohammad, and also of companions of the Prophet.

(Esposito 2004). The Shi'a and Sunni Muslim reformers of modern era promoted greater use of *Ijtihad* in legal matters. The rules of Ijtihad find its root in the body of principles and investigative methodologies called Usul al-Fiqh. The Usul al-Fiqh is the root of law, which forms the foundational sources of the practical legal rules.

A general principle adopted by the Muslim jurists is that prevention of harm takes precedence over securing a benefit. The Muslim scholars unanimously agree that if it is apparently clear the intention is unlawful, the action needs to be blocked. If it is otherwise, the act need not be prevented. The concept of Sadd al-dhara'i is based on the prevention of evil before it transpires. Sadd al-dhara'i is evoked in two types of circumstances. The first being when a lawful means is expected to an unlawful or harmful end. The second circumstance is when a lawful means which is expected to end in lawful result is used to yield evil or unlawful thing. Sadd al-dhara'i is complementary to maslahah as the ease or removal of hardship is a type of maslahah. 'Maslahah' means benefit or interest. The use of medical techniques to enhance fertility is a topical issue that cannot be overemphasized. Islam acknowledges that infertility is a significant hardship. Islamic Bioethics has a positive attitude towards reproductive technologies if it is carried out by a legally married couple. For married couples, procreation is not only encouraged, but also a necessity, *daruriyyat*. As this technology enables procreation, it would be most welcome in Islamic Bioethics.

Islamic medicines are grounded in the following sources:

(a) The two transmitted ones, maşādir naqliyyah of analogy, qiyās, and secondary consensus, ijma^{c} and (b) the logical ones, maşādir 'aqliyya, that are istiḥsān, istiṣḥāb, istirsāl, etc. (Islam 2015, pp-6). Reflections of Islamic law state maqāṣid al-sharĭah and help us derive robust and consistent legal rulings. Maqāṣid al-sharĭah, or the higher objectives, intents and purposes of Islamic law is aimed towards:

Ḥifẓ al-Dīn (protection of religion);
Ḥifẓ al-Nafs (protection of life);
Ḥifẓ al-Nasl (protection of progeny);
Ḥifẓ al-'Aql (protection of the mind);
Ḥifẓ al- Māl (protection of wealth).

So, the above-stated five reasons are the goals for conducting medical research in an Islamic community. If any of the five purposes is at risk, permission is then considered granted to conduct reproductive researches and experiments which would be otherwise morally according to Islam prohibited.

The primary source of Islamic ethics seems quite well matched to the four main axioms of medical ethics.

In the context of the principle of autonomy, respect for the person in Islam extends not only to person but also to embryo.

With regard to the principle of beneficence, Qur'an encourages doing good to not only individuals but extends to nations at large. Beneficence is directed not only to human beings but also to animals and plants.

The principle of non-maleficence finds mention in the Qur'an and the Hadith. It is said Islamic ethics expresses beneficence and non-maleficence not only in actions but also in feelings.

As is said the Qur'an orders justice for all without discrimination on the basis of race, social, political or financial reasons.

Muslim teaching is very flexible and adaptable to novel situations. However, morality and ethics in Islam are absolute and are of divine origin. Immoral actions in Islam are prohibited as 'Haram' and moral actions known as 'Mubaah' are automatically permitted (Afifi 2007, p. 296). In Islam, infertility and its remedy with the un-forbidden methods are allowed and encouraged. It is essential if it involves preservation of procreation and treatment of infertility in one partner of the married couples (Serour 1997, pp. 23–35). While discussing about preservation of progeny, Islam pays a special attention to the human reproduction and the maintenance of the human race on earth. Mankind is regarded as the guardian of earth and promulgator of divine wisdom serving the role of the vice gerent of the Almighty Allah on earth. Thus, in this context, according to Islamic laws stopping the reproduction process by any means, causing it to cease in any form or tampering with it any way or causing to reduce it, for no legitimate reason, is an unlawful practice.

Preservation of Lineage

Islam gives legal precedence to preservation of lineage. Posterity, progeny or lineage refers to all future generations collectively. Marriage is the foundation of a family, and the family forms the core of the society. In Islam, marriage besides protecting the rights of the husband and wife preserves the lineage and progeny. If both adultery and fornication called *zina* threaten posterity, then such acts are strictly prohibited and are a punishable offence in Islam (Fadel 2002, pp. 150–151).

Purity of lineage and blood relation is crucial according to the Islamic law. In Islam, the right of legitimacy is a natural and legal right. Children should be born out of the protective umbrella of spouses. Preserving the birth or bloodline has to do with honouring and fulfilling duties towards parents. The duties of parents towards their children and those of the children towards their parents are equally emphasized upon in the Islamic heritage. Keeping the ties of kith and kin and being tolerant and kind and respectful towards aged parents are part of the preservation of posterity by Islamic laws. An important fact to be noted that Shariáh demand respect of all creation including foetus. Abortion would lead or tantamount to eliminating one's own bloodline. Killing of a foetus is a grave sin. Abortion is granted only on the health condition of a mother, if continuation of pregnancy poses a threat to the life of the mother.

> Humans are in the highest echelons of God's creations. This is reinstated in the Quranic verse: We honoured the progeny of Adam. (Itani 2017:70).

Health is considered among God's most important bounties. The person is not the real owner of his/her body. It belongs to God. It is a trust and one has to preserve it. Some Islamic scholars tend to consider medical research directed

towards new treatments as a collective religious duty (*fardh kifaya*) (Fadel 2012, p. 130). Islam provides encouragement to contemplate and study nature, how the universe was created. Many Quranic verses tell people to explore new horizons (Ali, 29:20, 35: 29–30, 7:185). Prophet Muhammad ordered Muslims to get treated when they fall ill and to seek cures for all diseases.

Initially assisted reproduction technologies (henceforth ARTs) had not find much acceptance as it had been thought that embracing ARTs would be challenging God's will in trying to make a barren couple to be fertile. ARTs are new method of reproductive technologies which find no specific mention in the Islamic jurisprudence, Shariah. So the jurists or Ulema or Muslim scholars have to rely on methodologies of Ijtihad.

Medical issues are to be handled by the medical practitioners. A better understanding of such medical issues can be derived if the medical professionals are to enlighten the Muslim scholars about the rationale and methods related to the medical issues. At the same time, the Ulemas are to educate the medical practitioners about the fiqh concerning this medical issue.

An Islamic Outlook of IVF

ARTs have been a revolution in infertility treatment around the world. The birth of Louise Brown, the first 'test tube' baby, in 1978 through in vitro fertilization (IVF) was a breakthrough in the procreation process. IVF is a scientific process through which there is fertilization of the gametes by hormonal manipulation of the woman. The produced ova from woman are needle-aspirated at the proper time under ultrasonic guidance. And then the stimulated ovaries produce multiple oocytes; these oocytes are inseminated with sperms. The fertilization takes place outside the womb of the woman. After successful fertilization, post-insemination the embryos are transferred back to the uterus. At this juncture, the uterus has been prepared by hormones for the implantation of the embryos. This implanted embryo is carried by the wife till the birth of the child. IVF with the techniques like gamete intra-fallopian transfer (GIFT), or intra-cytoplasmic sperm injection (ICSI) if successful may yield offspring to a childless couple. From Islamic social structure, such techniques would be permissible provided *firstly*, the techniques are being implemented on a legitimately wedded couple. *Secondly*, the IVF should be done using the husband's sperm and eggs from the wife. *Thirdly*, these would be feasible if it is carried within the span of valid marriage. *Fourthly*, the procedures must be conducted under the competent guidance of medical practitioners so as to diminish the chances of failure. Special care should be taken so as to ensure that the gametes of the respective husband and wife had been actually used in this procedure. Lastly, the right number of fertilized eggs is to be transferred so that there would be less chance of multiple pregnancies or miscarriage or preterm delivery.

IVF and the Preservation of Progeny (*Hifz al Nasl*)

Islam holds parenthood is a natural instinct of human heart. As may be stated based on the principle that the *Sharī'ah* came to protect and preserve the lineage or *nasab* of the people and thus it is *haram* to marry a woman during her '*iddah*' or to have a sexual communion with a woman who is pregnant with another person's pregnancy.

According to the Organization of Islamic Council (henceforth, OIC) Resolution, IVF as a reproductive method is permitted in case of necessity and on conditions that required precautionary measures be adopted. IVF is Islamically acceptable and commendable if the following conditions are adopted.

1. Fertilization in vitro is permitted if it solely involves husband and wife and if it is done during their marriage span.
2. The communion of sperm and ovum should happen within the marriage contract.
3. Third-party donation of semen is forbidden.
4. A woman is allowed to be inseminated by the frozen sperm of her husband provided the couples are both alive.
5. A widow is forbidden to be impregnated by the sperm of her husband after his demise.
6. Even a divorced woman is forbidden to be impregnated by the fertilized ovum from her past husband.
7. Also, the usage of frozen sperm before the occurrence of Holy Communion or marriage is strictly admonished.

The excess of pre-embryos produced in the IVF process can be frozen and stored in liquid nitrogen; this process is called cryopreservation. Freezing of eggs, under Islamic law, is allowed provided the frozen eggs are the exclusive property of the couple who produced them alone and that these eggs are to be used by the same couples in subsequent cycles, while they still remain married to each other (Al-Bar and Chamsi-Pasha 2015, p. 179). In case of death and divorce, the cryopreserved sperm of the ex-husband cannot be used; as death terminates the marriage so do divorce renders the marriage void in legal way (Alaro 2012, pp. 95–108). In case of cryopreservation of gametes because of exposure to radiation or chemotherapy, these gametes can be re-implanted after the end of chemotherapy or radiotherapy, on the request of the gametes (Serour 2008). About the fate of frozen fertilized eggs that remain unused, nothing particular have been decided upon. It is believed that the unused eggs or gametes may be permitted to be used for medical research with the consent of the couple following appropriate guidelines.

To assess whether IVF is a valid medical procedure or not, we need to rely on the Islamic methodology of *Qiyās* (analogical deduction). *Qiyās* is a form of *Ijtihad*, which is expressly validated in the Hadith of Mu'adh b. Jadal. When a dispute arises, it can only be referred to God and to the Prophet by following the signs and significance that is revealed in the Qur'ān and *Sunnah*. One way of

achieving this is to identify the rationale of the *akham* and apply them to disputed cases, and this is precisely what qiyās is about (Kamali 1991, pp. 197–198). *Qiyās* is comprised of four fundamental elements. They are aṣl (an original case which has a well-settled ruling), far^{c} (a new case that is in need of a ruling), ‘illah (effective cause that holds similarity to both the original case and new case) and ukm (ruling of the original case which may find application in another case) (Hallaq 2002, p. 83). In this regard, IVF is the new case. The original case is the sexual union. The common effective cause for both the original case and the new case is multiple in numbers, like the general health of the baby, the sexual and general health of the parents and the protection of the parenthood and lineage. Grounded on the explicit Qur’ānic injunction, the legal decree concerning the original case is the permissibility and validity of cohabitation between validly married couples and the ban on lovemaking between unmarried couples amounting to adultery. In those instances where IVF bears resemblance to aspects of adultery or illegitimate coupling, the ruling of prohibition is applicable to IVF to make it prohibited, and where IVF is similar to cohabitation between validly married couples the ruling of acceptance and validity is extended to IVF to make it permissible. IVF becomes adultery when either the egg or sperm does not belong to the married couple, or when either of them is placed in the womb of a surrogate mother.

The Islamic Fiqh Council therefore holds that IVF is permissible if the husband’s sperm and his wife’s egg are fertilized and placed in the womb of the same wife. This is to be strictly followed for artificial insemination by third-party donor not only shares the elements of adultery but causes confused lineage, which goes against the aims and objectives of Islamic *Sharī‘ah.* Preservation of lineage occupies a high degree of importance in Islamic *Sharī‘ah.* This is required for clear identification of every person’s bloodline, or pedigree, in order to define and earmark parentage and marriage prohibition categories. Confusion in lineage may create the possibility that a biological sister and brother might end up in a marriage relationship without knowing that they are biological brother and sister. Such instances of marriage between biological brother and sister are prohibited in Islam as in many other religions (Zahraa and Shafie 2006, p. 163; Mitra 2017). The use of donor’s sperm or eggs or embryos is considered by most Islamic religious scholars to be a form of adultery, because a third party gets involved in the sacred relationship of husband and wife. Though there may not be the sexual ‘body contact’ of incestuous relations, yet the fact that another man’s sperm or another woman’s eggs are being inseminated where it should not belong making sperm or egg donation inherently wrong and threatening to the marital bond. Thus, Islam safeguards lineage by restricting illegitimate copulation and legal adoption, so as to keep the family line unambiguously defined, without any foreign element entering into it.

Because of sperm or egg donation, the biological father or mother becomes different from the ‘married couple’. The child born out of mixed bloodlines and adultery would never be treated with the love and care that parents feel for their ‘real’ children or children born out of normal conjugal relationship. A donor child is considered as an illegal child, literally a bastard (son of sin).

The Fatwa issued by Ayatollah Ali Hussein Khomeini in Iran in 1999 has paved the way for the third-party donation. The Shiáa guidelines through the Fatwa have allowed egg donation and sperm donation (Serour 2005, p. 187). All these practices of third-party donation are allowed based on the importance of maintaining the family structure among the Shi'aa family. They are permitted in the Shi'aa-dominant countries of Iran and Lebanon. In case of third-party reproduction, egg donation is more acceptable than sperm donation. They are accepted as 'last resorts' when all procedures have failed. They are allowed within various temporary marriage contract arrangements with the concerned donors. The Fatwa paved the way for considering the infertile couples, the parents of the donor child to be like adoptive parents. However, third-party reproduction assistance remains banned in the Sunni Muslim countries stretching from Morocco to Malaysia.

Apart from those fertilized eggs which are implanted in the womb, there generally remain excess fertilized eggs. A debatable issue arises not only in the selection of embryos for transfer but also controversy arises about the fate of the other remaining embryos.

IVF and the Preservation of Life (Ḥifẓ *al- Nafs*)

Through the IVF procedure, some sperms, ova and zygotes produced may remain surplus and unused. Ethical question may arise related to the fate of the spare embryo. One of the most significant debatable issues is (a) whether an embryo formed through the in vitro fertilization process in a test tube which is not implanted in the mother's womb can be considered at all a human being or not. The other contentious issues are (b) whether embryo can be created for research purpose and also it is questionable (c) whether we are justified in destroying spare embryos. With regard to the first question *if embryo procured through IVF should be considered a human or not*, we need to first understand the concept of soul or 'ruh' grounded on the Qur'anic teachings.

The discussion on pre-implantation embryos differs from the subject of the Qur'anic verse and ḥadīth that disapprove of man changing the creation of Allah. This is because the embryos procured through IVF are not about 'changing' but 'extracting' from the creation of Allah. Also, the fact that to every rule there is an exception, the exception in this instance is observed in terms of the extent of benefits that can be derived from avoiding the rule. Ibn Qayyim al-Jawziyyah holds that the *maqāṣid al-sharīᶜah* approach helps to safeguard people's interest and prevent them from experiencing harm in this world and the next. In fact, the principal objective of the Sharīᶜah is to enhance the welfare of all human, which lies in safeguarding the faith (*dīn*), their human self (*nafs*), their intellect (*ᶜaql*), their posterity (*nasl*) and their wealth (*māl*) (Olwale 2013, p. 109). That, what enables safeguarding these five objectives ensures serving the public interest and thus is desirable.

The objective of Sharīᶜah relating to our discussion of IVF concentrates on the protection of life. The controversy surrounds the fate of the surplus human embryos created by IVF, since the problem lies in using embryonic materials which some consider as having a life of their own. This brings us to the crux of the contentious

issue whether an embryo can be accorded the moral and legal status of a person from its conception or from the moment of its implantation in the mother's womb that is the time it has attached itself to the wall of the woman's uterus.

Theologians have a wide range of views about the humanity of the early embryo and whether we are allowed to tamper with it. Their views are grounded on their conception of when the human life begins.

Modern experimental embryology is a recent development in Medical Science. Until recently, it was not known that Qur'ān and Sunnah had provided a detailed description of the significant events in human development, from the conception and gametes level till the full term of pregnancy. Information in the Qur'ān and Hadith corrected many superstitious ideas about human development that were prevalent among the then Greeks. It was earlier believed that the foetus was created from menstrual blood or that the foetus was fully created in miniature form in either the sperm or ovum. This was refuted by Muslim scholars, who understood from the Qur'ānic passages and Hadith that foetus formation requires both the male and female contribution and that a series of developments were necessary, in order to form the foetus (Zindani et al. 2000, p. 5). The Qur'ān states: 'He (God) makes you in the wombs of your mothers, in stages one after another, within three veils of darkness…' (Surah Az-Zumar, 39: Āyah 6) and (Zindani et al. 2000, p. 24).

It is a matter of wonder that in the seventh century when Arabs lived as wanderer with no interest in inventions and discoveries we find the mention of human embryological development in a detailed manner. In Qur'ān, there is reference of various stages of conception, morphology and human development in many chapters. The three veils of darkness referred above may mean (1) the anterior abdominal wall; (2) the uterine wall; and (3) the amniochorionic membrane (Moore 1986, p. 15). Allah created man from a quintessence of clay and placed him as a nutfah (drop) in a place of rest (Sura 23: 13). Nutfah amshaj is the stage covering the period from fertilization to implantation. This germinal stage is further divided into Khalq, Taqdir, Harth.

Nutfah or drop has been interpreted as the sperm or spermatozoon, but amshaj means mixtures. So this may be described as the convergence of male and female fluids forming the zygote which has been placed in the rest, meaning that it has been implanted in the womb. Khalq is the stage which states that the convergence of male and female fluids may or may not form a zygote. If the zygote forms, a new being happens to be produced. The process of the fusion of two secretions to a single individual has been termed as Khalq. Taqdir follows the Khalq phase. The Holy Qur'ān calls it Taqdir phase which is termed as genetic programming phase in modern science. Taqdeer in Arabic language means planning, determining or programming. The Qur'ān mentions that these phases occur in immediate succession and the processes are completed within 30 h after fertilization (Saadat 2009, p. 105). Harth is the phase when the zygote migrates from fallopian tube to the uterus and gets implanted and receives nourishment and develops into a shape and structure. The Qur'ān mentions that the endometrial lining of the uterus is parallel to the soil where a seed may be embedded. As Hadith mentions: 'The Angel enters upon the conceptus (nutfah) after it rests in the uterus for forty or forty-five nights…' (Saadat 2009, p. 106).

The Qur'ān states that in the following stage there is further development. From the beginning of the third week up to the eighth week, rapid cell growth and cell differentiation take place. The mixed drop (nutfah) turns into a leech-like structure called 'alaca' (Sura 23:14). Alaca or 'Alaqah' has three references; it is either a leech or a suspended thing or a blood clot (Saadat 2009, p. 106 and Moore 1986). Just as the leech sucks blood from the host so do the human embryo derives blood from the deciduas or pregnant endometrium. This leech-like structure develops into a chewed lump or substance called mudghah (Sura 23:14). The human embryo at the end of the fourth week resembles a chewed lump of flesh. This appearance is a consequence of the somites which resemble teeth marks. The somites herald the start or primordia of the vertebrae. Out of the chewed lump stage, or mudghah stage, 'idham' are created. The word 'idham' in the Arabic language means bone and is specifically applied to the bones of the hands and feet and of the arms upon which is the flesh (Tzortzis 2011, p. 30). Now, there is clothing the bones with flesh; this is called Lahm-Al-Kisa. The word kasauna or kasāu means to dress, or to clothe, to garb, to cover up (Cowan 1976, p. 828). The word laḥm or laḥma means flesh meat (Cowan 1976, p. 861) as is revealed here. Then, (fa) we clothed the bones with laḥm, … The passage indicates that laḥm is the end of embryonic stage which is followed by Nashah stage. (Saadat 2009, p. 107)

The formation of the bones and muscles results in the development of another creature. This may signify the formation of human-like embryo at the end of the eighth week. At this stage, there is development of distinguishing human traits and possesses the primordia of all the internal and external organs and parts. The human embryo now is called the foetus. Following this, the special senses of hearing, seeing and feeling develop. The Sura 22:5 seems to indicate that God determines which embryo in the uterus will be carried to full term. For, it is known that many embryos get aborted in the first month of development and that only about few develop into foetuses that survive until birth. This *khalqan akhara* stage is the end of the embryonic stage and the beginning of a new growth phase. The term used in the Qur'ān to describe the final process corresponds to modern embryology. From the eighth week till the delivery is the period of growth and enlargement. In this period, the embryo begins to develop human-specific aesthetic features. It has been said that Messenger of Allah, the true and truly inspired offered, '(The matter of the Creation of) a human being is put together in the womb of the mother in forty day, and then he becomes a clot of thick blood for a similar period, and then piece of flesh for a similar period' (Sahih Al- Bukhari, narrated by Ibn Mas'ud, vol-004, book-054, Hadith no. 430 & Khan 1997, p. 276).

It is accepted by Muslim scholars that ensoulment occurs at 120 days after conception (Aksoy 2005, Morrison and Khademhosseini 2011). In Islam, human embryonic life is accorded respect at any stages of development even before the breathing of spirit into the foetus (Fadel 2007). However, the respect increases as the weeks pass until ensoulment when the child is entitled to full respect as accorded to an adult human being. To quote Ilkilic and Ertin,'…the ensoulment gives the embryo an exceptional moral status, which is decisive for the ethical assessment of any medical intervention affecting the embryo' (Ilkilic and Ertin 2010). The experimental use and therapeutic usage of human embryonic cells are permissible before

ensoulment conditioned on the application of necessary precautions when they are justifiable based on Islamic principles such as the public interest. The scholars in the conference of the Muslim World League's Islamic Jurisprudence Council held in Mecca in 2003 issued fatwa (religious decree) that the stem cells for therapy or experimental purpose is allowed as long as the cells' sources are permissible. Some of the accepted resources are placenta or umbilical cord blood of consenting adult; excess fertilized eggs received during IVF and spontaneously aborted embryos are some such resources. But the use of intentionally aborted foetuses is refrained from application for research purposes (Zahedi-Anaraki and Larijani 2011, p. 98).

As has been stated, from the Islamic perspective soul is breathed into the human embryo at 120 days after conception and that it is *ḥarām* to abort an embryo barring to safeguard the mother's life (Al-Mabid 2005, p. 203). Termination of pregnancy after 120 days is allowed so as to avoid committing greater evil by incurring the death of the mother and the embryo. Embryos for research are procured from pre-implantation embryos during the earliest days of conception. Therefore, our discussion will not concentrate further upon the topic of abortion. To address the question whether embryos can be produced for research, it may be observed that it is morally wrong to create embryos solely for the purpose of research since to create a life in order to end it rivals the actions that belong only to God. Human embryonic experimentation is permissible only if it serves the interest of the individual embryos or if the mother's life is at risk following the research the embryo can be transferred only to the owner of ova within the valid marriage contract (Schenker 1998, p. 2048). Thus, we should abstain from creating embryos for research motive.

With regard to the question whether we are justified in destroying spare embryos, it may be stated that Islamic ethics finds no problem in destroying the surplus fertilized ovum (Islam et al. Islam et al. 2013, p. 126). One may doubt whether destroying spare embryo is a form of abortion or not. It is to be noted that abortion takes place after the implantation of the embryo in the womb and it happens in the woman's body not in the laboratory Petri dish. In Islamic law, the fertilization process outside the uterus is restricted to a single ovum that would solve the problem of discarding other fertilized ova. But it may be argued that in normal circumstances, if more than one ovum is fertilized, nature takes care of that by expelling the other fertilized ova. Thus, would it not be equally justified to discard other fertilized ova and use only one of them for implantation?

To determine whether one is justified in destroying spare human embryos, one needs to go back to the fundamental question, 'when does human life begin?' The answer to this specific question attracts opposing views for there is no specific definition of the timing of the beginning of life in either the Qur'an or Sunnah. There are differences of opinion about the onset of life and the time when the ensoulment—the infusion of the soul into the body of the foetus, followed by the conferring of moral status on the foetus—occurs. To some Islamic jurists, conception is the starting point of human life. The advocates of this view opine that the fertilized ovum takes about seven days before it gets settled in the uterus. One of the main characteristics of this position is the general conviction that biomedical and scientific knowledge should be given precedence over the opinions expressed by classical Muslim religious scholars. Additionally, this scientific knowledge should be the prominent

condition when choosing one of the possible expositions and understanding of the scriptural texts. The Ḥanbalī school of law was of the opinion that embryo before the soul-breathing stage is not living and thus one can get rid of the embryo before breathing the soul (Ghaly 2012, p. 181). The Kuwaiti religious scholar ʻAbd Allāh Muḥammad ʻAbd Allāh referred to the thirteenth-century religious scholar ʻUmar b. Muḥammad al-Sunāmī who made reference to Ibn Masᶜūd which implies breathing the soul in the embryo takes place after 120 days. One of the followers of this position Dr. Ḥaṯḥūt disagreed in calling life prior to the moment of soul-breathing as vegetative or animal life contrary to human life that begins after the soul-breathing. He questioned that plants lack active motor systems as well as nervous systems, so how human life could be compared to plants. Also, unlike human, plants feed themselves with light, absorb carbon dioxide and emit oxygen (Ḥaṯḥūt 1985, p. 57). Additionally, the fertilized ovum of human would never develop into an animal but just a human being (Madhkūr et al. 1985, p. 206).

The Prophetic traditions, practical rulings in Islamic law, and the opinions adopted by early authoritative Muslim religious scholars hold that human life exists even in the stage of the embryo (Madhkūr et al. 1985, p. 303). In Islamic law, pregnancy holds importance without differentiating the period before or after breathing the soul. In Islam, suppose a pregnant woman is subjected to death sentence, then her death penalty gets postponed until her delivery of her baby. The fact that this postponement should occur irrespective of whether the pregnancy is in its initial or final stage entails Islamic law which sees that there is life that should be respected. Or else, why the death penalty would be postponed then (Ḥaṯḥūt 1985, pp. 59–60; Madhkūr et al. 1985, pp. 219–220, 303).

A well-known Muslim jurist, theologian and mystic Abū Ḥāmid al-Ghazāli (d: 111), an advocate of this position, opined that life should be respected from the initiation of pregnancy and so any offence against this life is subjected to punish from Islamic standpoint (Ghaly 2012, p. 185). The existence of life, which should be revered according to Islam, starts from the time of fertilization, and any action against this being is condemned. To this, the other group of scholars contend that a fertilized ovum can be damaged before the stage of soul-breathing. Such an opinion is grounded on the belief that a fertilized ovum before breathing the soul can be just congealed blood. This leads to the second position which holds that human life starts by breathing the soul, which happens later than the time of conception.

The proponents of this second position quotes Qur'an as supporting argument. To quote the Qur'anic verses: Man We did create from a quintessence of clay. Then we placed him as a fluid-drop (*nuṭfa*) in a place of rest, firmly fixed. Then we made the fluid-drop into a clot of congealed blood (*ʻalaqa*); then of that clot we made a (foetus) lump (*muḍgha*); then we made out of that lump bones and clothed the bones with flesh; then we developed out of it another creature. So blessed be Allah, the best to create! (Sūra Al-Mūminūm-23 Āyat: 12–14; Ali 1987). Based on these verses, Dr. Bāsalāma contended that the embryo undergoes three stages:

(1) The cellular stage when the fertilized ovum of a human being remains hardly indistinguishable from what we can find inside the uteruses of some animals.
(2) The *ʻalaqa* and *muḍgha* stage when one can observe a human-like being,

(3) The soul-breathing stage that takes place when the nervous system, including the brain, gets fully shaped and the verse expressed this stage by conforming, 'Then we developed out of it another creature' (Bāsalāma 1985, pp. 78–79).

Different prophetic traditions, especially Ibn Masᶜūd tradition, stated that the nutfa stage consists of the 40 days from conception, and the same period is also allocated for each of the *'alaqa* and *muḍgha* stages. This tradition mentions that the angel breathes the soul into the embryo after the end of these three stages, that is, after 120 days.

Those supporting the stand that breathing the soul is the starting point of human life focused on two issues, namely associating the soul-breathing with the beginning of human life and the exact timing of breathing the soul. Regarding the first point, the advocates of this second position unanimously agreed that breathing the soul, as implicit in the Qur'anic verses and as explicitly mentioned in the tradition of Ibn Masᶜūd, should be earmarked as the beginning of human life and not as just an incident that occurs during the embryonic life. They also unanimously agreed that death happens when the soul leaves the body (Yāsīn 1985, pp. 93–95). In Qur'an, life means exclusively breathing the soul, and thus the period before this stage can simply be termed as death and the embryo prior to breathing the soul is dead from the Qur'anic standpoint (Ashqar 1985, pp. 134–135). As for the exact timing of breathing the soul, the proponent of this perspective agreed that it cannot be equated with the moment of conception, but it would happen on a later date.

The Qur'anic text 'then he becomes a clot of congealed blood ('alaqa) for a similar period' may be read as 'then he becomes *in this* a clot of congealed blood ('alaqa) for a similar period'. 'In this' here is interpreted as that '*alaqa* stage starts during, and not at the completion of, the *nutfa* stage, and even this holds true for the *muḍgha* stage that would begin during and not after the end of the '*alaqa* stage. So the forty days that each stage comprised of are not distinct, but they overlap with each other and thus the total should not be 120 days but less than this. Keeping in mind that the foetus passes through an important phase in the twelfth week, then the total of the three overlapping for should be calculated as 84 days, and this is the date of breathing the soul (Mahdī 1985, pp. 70–71).

With regard to using the surplus fertilized ova for scientific research, the question arises, are we allowed to kill the surplus fertilized ova or would it be sinful if we did so? Dr. Ma'mūn Ibrāhīm argued a distinct demarcation is required between surplus fertilized ova and the embryo placed in the mother's womb. The fertilized ovum has just a partial life, which is not different from the life attached to the male sperm and the female non-fertilized ovum, and thus its dignity should be equal to their dignity (Ibrāhīm 1995, pp. 450–455).

Most of the religious scholars opined that the production of surplus fertilized ova is to be avoided. If this was unavoidable and there were surplus fertilized ova, then the majority of the religious scholars stated that they lack sanctity (ḥurma) of any type or dignity (iḥtirām) before being implanted in the wall of the uterus. The debate around the use of the surplus fertilized ova for research purpose now focused on *al-maṣāliḥ al-mursala* (public benefits) approach. The perspective undertaken by the Islamic Organization for Medical Sciences (IOMS) during their international

symposium stated that, 'Fertilized eggs surplus to the requirements of IVF possess no privileged status and enjoy no sanctity before their implantation. It follows that there is no objection to any method of disposing of them. Hence, using them for the purposes of treatment and scientific research is better than wasting them' (http://www.islamset.com/ioms/cairo2007/index.html). So, the surplus fertilized embryos have a good potential for research purpose for benefit of human. But the couple must be allowed to exercise free informed consent and the research is to be conducted for therapeutic end. Research aimed at changing the inherited traits of pre-embryos including sex selection is not allowed. Non-therapeutic research is permissible on excess pre-embryos to improve the treatment of infertility, embryology and reproductive medicine provided that the couple have been allowed to exercise informed consent free of coercion.

Professor Sachedina affirmed that all Sunni and most Shite jurists do not find moral problem regarding application of frozen embryos for biomedical research. However, he warns against using of spare embryo for they may bear a negative consequence of devaluing pre-implanted embryos, which may lead to their becoming commercialized and expressly produced as a source of therapeutic products (Sachedina 2000). IVF holds importance in Islamic juridical, and its place in the Islamic sects requires discussion.

Sunni Islam and IVF

In the Middle East, understanding local moral worlds involves asking what Muslim ART-seekers think about IVF. How do disparate Sunni-Shi'a stances towards reproductive technologies and gamete donation influence the 'local moral worlds' of Muslim infertile couples, longing desperately to procreate? To understand local moral attitudes towards science and technology and religion in the Middle East demands ethnographic engagement not only with reproductive actors themselves, but also with those accessing gamete donation across national and sectarian bifurcation.

In the discussion about religious attitudes towards IVF, it would be better to begin with Sunni Islam, which is the dominant form of Islam throughout the Muslim world. The earliest *fatwas* on ART practice emerged in the Sunni strongholds of Egypt, Saudi Arabia and Jordan. With regard to IVF specifically, the Grand Sheikh of Egypt's famed Al Azhar University issued on 23 March 1980 the first *fatwa* on reproductive technologies and this fatwa was issued only 2 years after the first IVF birth in England. However, it took six long years for the opening of Egypt's first IVF centre. The Sunni Islamic position on assisted reproduction allows IVF and the use of egg from the wife with the sperm of her husband and allows the fertilized embryo transfer to the wife's womb. However, they strictly prohibit third-party donation of sperm, eggs and embryos or even against womb lending. In all of the Sunni-dominant Muslim countries including the Middle Eastern countries of Egypt, Kuwait, Jordan, Morocco, Qatar and Turkey as well as non-Mid-East countries such as Indonesia, Malaysia and Pakistan, sperm donation in IVF and all forms of gamete donation were forbidden. Even all forms of surrogacy are forbidden. Even adoption of a child procured through an illegitimate form of medically assisted conception is

not allowed. Also, since marriage is a contract between the wife and husband during their lifespan, any third-party donation is a adultery (*zina*). So, also medically assisted conception cannot be performed on the ex-wife even if the sperm is from the former husband. Artificial insemination is forbidden as it leads to lineage confusion whose purity is of prime significance in Islam (Inhorn 2006a, p. 44). Excessive embryos are allowed for cryopreservation. However, they maintain that preserved embryos are the property of the couple alone and may be transferred to the same wife in a successive cycle, but are limited within the marriage contract. Multi-foetal pregnancy reduction that is selective abortion is permitted only if the health or life of the mother is at stake, or when the prospect of carrying the pregnancy to term is very small.

Having said all this, it is very significant to pinpoint how things have relatively changed for Shi'ite Muslims.

Shi'a Islam and IVF

The Shi'a Islam view on IVF or gamete donation has changed considerably over the years. Until recently, the Shi'a religious authorities agree with the Sunni clerics that third-party donation should be strictly banned. The Shi'a is a minority branch of Islam that finds prominence in Iran, Lebanon, Bahrain, Syria some parts of Iraq, India, Afghanistan and Pakistan. In Lebanon, Iran, the Iranian-supported Hezbollah political party's clerical elites favour a contemporary outlook of Islamic law and so they make room for IVF and allow third-party donation. The Shi'a clerics Ayatollah Ali Hussein Khamanei, the Supreme Jurisprudent of the Shi'a Muslim, have chosen Iran's Ayatollah Khomeini who has issued Fatwa connecting donor insemination. The infertile mother must by all means follow the Islamic codes concerning parenting. The child born out of such third-party donation or egg donation is not an illegitimate child.

The infertile woman who received the embryos for conception is considered as an adoptive mother. In case of sperm donation, Ayatollah Khamanei states the child inherits the name of the infertile father and not of the sperm donor who is the biological father. The infertile father is considered to be like an adoptive father.

Shi'a scholars have pointed out that the practice of Ijtihad has introduced a certain fluidity and pragmatic outlook towards IVF. Furthermore, Ijtihad finds prominence in the Shi'a thinking than in the Sunni Muslim outlook. Through the application of 'aql' or intellectual reasoning, Shi'a scholars or ulama have reached their own conclusion concerning the rightness and wrongness of the use of the techniques of IVF.

The Shi'a scholars are in favour of temporary marriage called mut^{c}a. Such temporary marriage do not find acceptance in Sunni Muslims. Mut^{c}a is a union between an unmarried Muslim woman and a married or unmarried Muslim man contracted for a fixed period for financial benefits. With the advent of IVF, mut^{c}a has been invoked to make egg donation a legal practice within the parameters of marriage. The husband is allowed to do a mut^{c}a marriage with the egg donor for the time period in which the whole technique of egg retrieval to embryo transfer is taking place

(Inhorn 2006b, p. 435). This is acceptable as polygamy is not forbidden in Islam. On the other hand, a married Muslim woman cannot marry another man apart from her husband for polyandry is forbidden in Islam. She cannot undergo a mut^{c}a union with a sperm donor. Theoretically, a single woman or a widowed is permitted to be inseminated by the donor's sperm to avoid committing adultery. But in reality single motherhood of a donor's child is hardly acceptable in Muslim society. Interestingly, there are disagreements of opinions among Shi'a Muslim clerics about IVF. There is opposition regarding sperm donation but support regarding egg donation. Egg donation is permissible so long the husband is permitted to marry the egg donor temporarily ensuring that the infertile wife, the husband and the egg donor remain married. On the other hand, a fertile married woman with an infertile husband cannot temporarily marry a sperm donor, so sperm donation is strictly prohibited. Some Shi'ite religious head in Iraq like Ayatollahs Ali al-Sistani and Muhammad Sa'id al-Tabataba'i al-Hakim advice caution against third-party donation practices, viewing them as largely unacceptable.

The Change of Attitude of the Shi'a Muslim Towards IVF

For the Sunni Muslim, the use of IVF has clearly led to an entrenchment of deeply held religious beliefs about the significance of biological outlook on family, life and progeny, whereas these technologies to the Shi'a Muslim have fundamentally changed the understandings of the different avenues through which the families can be made and marriages can be saved using IVF. The Sunni religious authorities strictly prohibited third-party donation because as is stated it leads to lineage confusion. Strikingly, the contemporary Shi'a men in order to maintain their rightful position as fathers and to reproduce their social group are ready to forgo their strong belief in producing offspring purely through natural or biological means. Rather they are ready to become father of a donor child or a child through donor insemination so long this is done in secrecy. It may be pointed out that there may be differences of opinion between the Shi'a and the Sunni. Despite the dichotomy, both the Shi'a and the Sunni agree to maintain the essential value of preservation of lineage and human reproduction. Having children and perpetuating kinship structures into the future is important for both Shi'a and Sunni. They are achieving reproduction through the use of medical technologies. In both the cases, reproduction using technologies is to be assisted by their religious authorities, whose role in the introduction, permission, innovation and expansion of IVF in the Islamic world cannot be overstated (Inhorn and Tremayne 2012).

However, the actions of the Iranian Shi'a clerics directly affect and influence the large Shi'a populations in the Middle East and in other countries. Both the Sunni and Shi'a groups have been reactionary in their discourse revolving around issues of IVF which has left both sects divided on approaches, procedure and that which is allowed within the Islamic institute of marriage. The evolution of IVF in Shi'a-dominated countries, particularly Iran, is inextricably linked with the broader and continued interest and involvement of the state in the broader and continued interest and involvement of the state in the reproductive life of its

citizens. The direct or indirect attempt by the Iranian state to control the population, to either increase or decrease its growth, dates back to the nineteenth century under the late Qajar Dynasty (1785–1925), which aimed to encourage population growth (Kashani-Sabet 2011). Iran has seen significant highs and lows in population growth rates since the Islamic Revolution. In the late 1980s, fatwas were issued by the Ayatollah for the use of family planning methods such as birth control for married couples in Iran. Earlier to this, there was a push for Iranian couples to procreate plentifully due to the killing of several Iranian men in the Iran–Iraq war. The push for Iranian couples to procreate led to many births, and with a struggling economy and a deflated workforce, the country's leaders had to curb and control the overwhelming population growth. However, these steps towards family planning led to a steady decrease in population, leaving the country's population in a different situation altogether.

Following the drop in population growth to below the replacement level, the authorities have reintroduced some of the pro-natalist policies of the early 1980s, as reported by Population Policy (2010). While the family planning programme of the 1980s delivered most of its promises, it failed to address infertility, which remained unfulfilled. The stigma of infertility remains an imperative in the Middle East countries where biological relatedness remains the only acceptable form of procreation. Procreation for the perpetuation of family and kinship are fundamental and sacrosanct in Iranian culture. Against this backdrop, IVF was introduced in the Shi'-dominant countries as Iran. Indeed, the use of IVF in a range of contexts such as pre-implantation diagnosis, gene selection, sperm, egg and embryo donation; surrogacy; and fertility preservation are common place in Iran (Tremayne and Akhondi 2016, p. 66).

Lebanon, a country with dominance of Shi'a Muslim population, offers a particularly rich environment for reproductive research (Inhorn 2004, 2006c). Lebanon has a strikingly large number of well-frequented IVF centres for its population size and expatriate Lebanese. Lebanon's religious and medical ethical diversity and communitarian legal and political system have made it as yet impossible to reach an ethical unanimity with respect to assisted reproduction and to enact legislation regulating procedures such as IVF.

However, no self-respecting Lebanese women, Muslim or otherwise be seen publicly pregnant with the child of a man apart from her husband. Sexual propriety is equally the principle around which the Islamic debate turns (Clarke 2008, p. 162). In case of surrogacy, many Shiite jurists agree with the Sunnis that maternity would be assigned to the gestational carrier and deliverer of the child. Ayatollah Khamene'i, spiritual leader of the Islamic Revolution in Iran, which has long aided Lebanon in financial and military matters, observes that the use of sperm and eggs from donors does not tantamount to adultery, which, rather, entails sexual intercourse. Lebanon's own Ayatollah Fadlallah finds the use of donor sperm beyond the pale, but does allow the use of donor eggs. However, not all Shi'ites who otherwise follow the rulings of Khamene'í are willing to take up the possibility of using donor sperm in case of need. Though the practice of individual reasoning (Ijtihad) among leading religious scholars in Iran and Lebanon's Shi'a Islamic communities has permitted a certain flexibility and pragmatism towards the adoption of these reproductive

technologies, third-party gamete donation and surrogacy continue to be controversial practices within these Shi'ite societies (Purvis 2015, p. 701).

It is to be noted in Islamic law both in Sunni and in Shi'a sects, all children born to a married couple are considered as the children of that couple. If a wife is suspected of adultery by her husband, that her child is born out of another man, then the husband must reject her and her child by swearing a mighty oath (*li'ân*), and this must be done within a defined period from the birth of the child. If he does not do so, the child is ascribed to him and cannot be considered otherwise. Sometimes, then, *nasab* ('filiation') might be awarded by default to a child who is not the biological child. Significantly, not all biological begotten children are legitimately claimed as *nasab*. They are denied paternal relations in Sunni thought, and paternal and maternal relations in Shi'ite thought (Kohlberg 1985). Islamic law does mandate biological relatedness contingently, as sex outside marriage is prohibited and if this prohibition be strictly followed every children would be biologically related to their social parents. But that consideration hardly transforms *nasab* to biogenetic relation. To quote Munawar Anees, a Muslim intellectual in the context of the discussion of significance of reproductive technologies, 'Islam, therefore, does not endorse parenthood as two distinct entities: biological and social—Muslim parenthood is biosocial' (Anees 1984, p. 116). The significance of legitimacy of birth extends in Lebanon beyond communitarian doctrine, and those born due to forbidden relationship are perceived as ill-fated and unwelcome.

It is interesting to note that there are mixed responses of many Shi'ite religious leaders both inside and outside of Iran towards the acceptance of donor technologies for procreation. Many ulama like the Shi'ite *Sharī'a* judge from Bahrain argue against the moral permissibility of embryo and gamete donation. Again, Ayatollahs Ali al-Sistani and his son Muhammad Rida Al-Sistani, Shi'ite religious authorities in Iraq, had hugely debated about the permissibility of third-party donation. Rida Al-Sistani has devoted an entire volume of richly documented legal analysis to this debate which has opened up for other scholars a fascinating window into this realm of Shi'ite jurisprudential debate (Clarke 2006, p. 26). At the same time, Iranian clergy and physicians are in favour of advocating for future laws permitting all forms of donation as well as surrogacy (Inhorn 2006b, p. 439).

Thus, it may be pointed out that the Shi'a are trying to orchestrate a different game. On the international front, they are projecting themselves as modern Shi'a state that provides IVF for its citizens, permitting procreation. This portrays them as more moderate and liberals than their Sunni counterparts who have altogether shunned donor insemination. On the domestic level, their government, particularly Iranian government, is willing to assist their women in family planning, by providing IVF treatments to those unable to conceive naturally.

Conclusion

The emergence of IVF in the Muslim world and the recent introduction of donor insemination in Iran and Lebanon have led to a fascinating endeavour in the world of medical practices, that is, reshaping the gender dynamics of infertile married

couples. The acceptance of third-party gamete donation by the otherwise conservative male Shi'ite religious leaders has led to a potential transformation in gender relations among infertile Muslim couples. The arrival of reproductive technologies in the Muslim world has led to a brave new world of reproductive possibility which could be hardly imagined at the time of the introduction of these reproductive technologies. These technologies have engendered the birth of donor babies to devout infertile Muslim couples.

The cultural construction of science is a global phenomenon which through the exchange of views and knowledge of techno culture often takes interesting twist and turns in places of the world far removed from the developed Western world.

Acknowledgements Special thanks are due to Professor Priyambada Sarkar and to Professor Dilip Kumar Mohanta, wonderful teachers and faculty members of the Department of Philosophy, University of Calcutta, India. I would also like to thank the reviewers for their careful reading of the manuscript and their insightful suggestions and comments that helped me to improve and sharpen the previous version of the paper.

Compliance with ethical standards

Conflict of interest The author declares that there is no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

References

Afifi, R. Y. (2007). Biomedical research ethics: An Islamic view—part I. *International Journal of Surgery, 5*(5), 292–296. https://doi.org/10.1016/j.ijsu.2006.04.011.

Akhondi, M. M. (2016). Conceiving IVF in Iran. *Reproductive BioMedicine and Society Online, 2,* 62–70. https://doi.org/10.1016/j.rbms.2016.07.002.

Aksoy, S. (2005). Making regulations and drawing up legislation in Islamic countries under conditions of uncertainty, with special reference to embryonic stem cell research. *Journal of Medical Ethics, 31*(7), 399–403.

Alaro, A. A. (2012). Assisted reproductive technology (ART): The Islamic law perspective. In A. Berna & R. C. Vardit (Eds.), *Islam and bioethics* (pp. 95–108). Turkey: Ankara University.

Al-Bar, M. A., & Chamsi-Pasha, H. (2015). Assisted reproductive technology: Islamic perspective. In *Contemporary bioethics* (pp. 173–186). Berlin: Springer.

Ali, A. Y. (1987). *The holy Qur-ān: English translation of the meanings and commentary*. Al-Madina Al-Munawarah: The Presidency of Islamic Reserches, IFTA, Call and Guidance.

Al-Mabid, M. A. (2005). *Maslahah hifz al-nafs fial-shari 'aal-Islamiyyah*. Cairo: Mu'ssasah al-Mukhtar.

Anees, M. (1984). Islamic values and Western science: a case study of reproductive biology. In Z. Sardar (Ed.), *The touch of Midas: Science values and environment in Islam and the West*. Manchester: University Press.

Ashqar, U. S. (1985). Bad' al-ḥayāh wa nihāyatuhā [The beginning of life and its end]. In K. al-Madhkūr, A. Sayf, A. Rajā'ī al-Jundī, & A. al-Sattār Abū Ghudda (Eds.), *Al-ḥayāh al-insāniyya: bidāyatuhāwa nihāyatuhā fī al-mafhūm al-Islamī [Human life: its beginning and its end from an Islamic perspective]* (pp. 130–153). Kuwait: Islamic Organization for Medical Sciences.

Bāsalāma, A. A. (1985). Al-ḥayāh al-insāniyya dakhil al-rahim: bidyātuhā wa nihāyatuhā [Human life inside the womb: its beginning and its end]. In K. al-Madhkūr, A. Sayf, A. Rajā'ī al-Jundī & A. al-Sattār Abū Ghudda (Eds.), *Al-ḥayāh al-insāniyya: bidāyatuhāwa nihāyatuhā fī al-mafhūm*

al-Islamī [*Human life: its beginning and its end from an Islamic perspective*] (pp. 77–83). Kuwait: Islamic Organization for Medical Sciences.
Clarke, M. (2006). Shiite perspectives on kinship and new reproductive technologies. *ISIM Review, 17*(1), 26–27.
Clarke, M. (2008). New kinship, Islam, and the liberal tradition: Sexual morality and new reproductive technology in Lebanon. *Journal of the Royal Anthropological Institute, 14*(1), 153–169. https://doi.org/10.1111/j.1467-9655.2007.00483.x.
Cowan, J. M. (1976). *H. Wehr: A dictionary of modern written Arabic*. New York: Spoken Language Services, Inc. Retrieved from: https://ia800200.us.archive.org/17/items/Dict_Wehr.pdf/Wehr.pdf.
Esposito, J. L. (Ed.). (2003). *The Oxford dictionary of islam*. New York: Oxford University Press.
Esposito, J. L. (Ed.). (2004). *Ijtihad—The Islamic world: Past and present*. Oxford: Oxford University Press.
Fadel, H. E. (2002). The Islamic viewpoint on new assisted reproductive technologies. *Fordham Urban Law Journal, 30*(1), 146–157.
Fadel, H. E. (2007). Prospects and ethics of stem cell research: An islamic perspective. *Journal of the Islamic Medical Association of North America, 39*(2), 73–83.
Fadel, H. E. (2012). Developments in stem cell research and therapeutic cloning: Islamic ethical positions: A review. *Bioethics, 26*(3), 128–135.
Ghaly, M. (2012). The beginning of human life: Islamic bioethical perspectives. *Zygon., 47*(1), 175–213.
Hallaq, W. B. (2002). *A history of islamic legal theories: An introduction to sunni Uṣūl al- Fiqh*. Cambridge: Cambridge University Press.
Hallaq, W. B. (2004). *The origins and evolution of Islamic law*. New York: Cambridge University Press.
Hallaq, W. B. (2009). *Sharī'a-theory, practice, transformations*. New York: Cambridge University Press.
Ḥaṭḥūt, H. (1985). Bidāyat al-ḥayāh [The Beginning of life]. In K. al-Madhkūr, A. Sayf, A. Rajā'ī al-Jundī & A. al-Sattār Abū Ghudda (Eds.), *Al-ḥayāh al-insāniyya: bidāyatuhāwa nihāyatuhā fī al-mafhūm al-Islamī* [*Human life: its beginning and its end from an Islamic perspective*] (pp. 55–61). Kuwait: Islamic Organization for Medical Sciences.
Ibrāhīm, Ma'mūn al-Ḥāj 'Alī (1995). Al-buwayḍāt al-zā'ida 'an al-ḥāja: mādhā naf'al fīhā? [The surplus fertilised ova: what should we do with them?]. In Khālid al-Madhkūr, 'Alī Sayf, Aḥmad Rajā'ī al-Jundī, and Abd al-Sattār Abū Ghudda. *Al-ru'ya al-Islāmiyya li ba'ḍ al-mumārasāt al-ṭibbiyya* (*The Islamic vision of some medical practices*) (pp. 450–455). Kuwait: Islamic Organisation for Medical Sciences.
Ilkilic, I., & Ertin, H. (2010). Ethical aspects of human embryonic stem cell research in the Islamic world: Positions and reflections. *Stem Cell Review, 6*(2), 151–161.
Inhorn, M. C. (2004). Middle Eastern masculinities in the age of new reproductive technologies: male infertility and stigma in Egypt and Lebanon. *Medical Anthropology Quaterly, 18*(2), 162–182. https://doi.org/10.1525/maq.2004.18.2.162.
Inhorn, M. C. (2006a). Islam and everyday life in the Middle East: The making of Sunni versus Shi'ite test-tube babies. *Anthropologyof the Middle East, 1,* 42–50.
Inhorn, M. C. (2006b). Making muslim babies: IVF and gamete donation in sunni versus Shi'a islam. *Culture, Medicine and Psychiatry, 30,* 427–450.
Inhorn, M. C. (2006c). He won't be my son. *Medical Anthropology Quarterly, 20*(1), 94–120. https://doi.org/10.1525/maq.2006.20.1.94.
Inhorn, M. C., & Tremayne, S. (Eds.). (2012). *Islam and assisted reproductive technologies: Sunni and Shia perspectives*. New York: Berghahn.
Islam, S. (2015). *Ethics of assisted reproduction medicine: A comparative study of western secular and Islamic bioethics*. London: International Institute of Islamic Thought.
Islam, S., Rusli, B. N., & Hanapi, B. M. N. (2013). Ethical consideration on in vitro fertilisation technologies in Bangladesh. *Bangladesh Journal of Medical Science, 12*(02), 121–128.
Itani, T. (2017). *The quran-English translation*. Dallas: Clear Quran.
Kamali, H. M. (1991 and 2005). *Principles of Islamic jurisprudence.* Cambridge: Islamic Text Society.
Kashani-Sabet, F. (2011). *Conceiving citizens: Women and the politics of motherhood in Iran*. New York: Oxford University Press.
Khan, M. M. (1997). The book of the beginning of creation. In *The translation of the meanings of Sahīh Al-Bukhâri* (M. M. Khan, Trans., Vol. 4, p. 276). Riyadh: Darussalam.
Kohlberg, E. (1985). The position of the walad zinâ in Imâmî Shî'sm. *Bulletin of the School of Oriental and African Studies, 48*(2), 237–266. https://doi.org/10.1017/S0041977X00033334.

Madhkūr Khālid al-, ʻAlī Sayf, Aḥmād Rajāʾī al-Jundī, and ʻAbd al-Sattār Abū Ghudda (eds.). (1985). *Al-ḥayāh al-insāniyya: bidāyatuhā wa nihāyatuhā fī al-mafhūm al-Islamī* [*Human life: its beginning and its end from an Islamic perspective*]. Kuwait: Islamic Organization for Medical Sciences.

Mitra, P. (2017). Philosophical ruminations about embryo experimentation with reference to reproductive technologies in Jewish "Halakhah". *IAFOR Journal of Ethics, Religion & Philosophy, 3*(2), 5–19. https://doi.org/10.22492/ijerp.3.2.01.

Moore, K. L. (1986). A scientist's interpretation of references to embryology in the Qur'an. *The Journal of the Islamic Medical Association of North America, 18,* 15–17.

Morrison, D. W., & Khademhosseini, A. (2011). *Stem cell science in Iran published by the Iranian studies group (ISG).* Retrieved 2011, from Masachusetts Institute of Technology. http://isgmit.org/projects-storage/StemCell/stem_cell_iran.pdf.

Yāsīn, Muhammad Naᶜīm. (1985). Bidāyat al-ḥayāh al-insāniyya fīḍaw' al-nuṣūṣ al-shar'iyya wa ijtihādāt 'ulamā' al-muslimīn [The beginning of human life in the light of the religious texts and the interpretations of Muslim scholars] In Khālid al-Madhkūr, 'Alī Sayf, Aḥmād Rajā'ī al-Jundī, and 'Abd al-Sattār Abū Ghudda (Eds.), *Al-ḥayāh al-insāniyya: bidāyatuhāwa nihāyatuhā fī al-mafhūm al-Islamī* [*Human life: its beginning and its end from an Islamic perspective*] (pp. 130–153). Kuwait: Islamic Organization for Medical Sciences.

Mahdī, Mukhtār al-. (1985). Bidāyat al-ḥayāh al-insāniyya[The beginning of human life]. In Khālid al-Madhkūr, 'Alī Sayf, Aḥmād Rajā'ī al-Jundī, and 'Abd al-Sattār Abū Ghudda (eds.) *Al-ḥayāh al-insāniyya: bidāyatuhāwa nihāyatuhā fī al-mafhūm al-Islamī* [*Human life: its beginning and its end from an Islamic perspective*] (pp. 62–73). Kuwait: Islamic Organization for Medical Sciences.

Olwale, F. A. G. (2013). Islamic ethics and stem cell research. *Islam and Civilisational Renewal, 4*(1), 103–116.

Population Policy. (2010). https://www.populationinstitute.org/resources/populationonline/issue/8/53/. October, 2015.

Purvis, T. E. (2015). Assisted reproduction in Indonesia: Policy reform in an Islamic culture and developing nation. *Reproductive BioMedicine Online, 31,* 697–705.

Saadat, S. (2009). Human embryology and the holy quran: An overview. *International Journal of Health Sciences, 3*(1), 103–109.

Sachedina, A. (2000). Testimony. *Ethical issues in human stem cell research.* Vol-III religious perspectives. National Bioethics Advisory Commission (Ed.), Rockville, MD: National Bioethics Advisory Commission: G (pp. 1–6). http://bioethics.georgetown.edu/nbac/stemcell3.pdf. Accessed December 15, 2017.

Schenker, J. G. (1998). International regulation of human embryo research, FIGO statements and world experience. *Human Reproduction, 13*(8), 2047–2049. https://doi.org/10.1093/humrep/13.8.2047.

Serour, G. I. (1997). Bioethics in human reproduction in the muslim world. In *Proceedings of a seminar on ethical implications of use of assisted reproductive technology for treatment of human infertility.* Cairo, Egypt: Al-Azhar University.

Serour, G. I. (2005). Religious perspectives of ethical issues in ART: Islamic perspectives of ethical issues in ART. *Middle East Fertility Society Journal, 10*(3), 185–190.

Serour, G. I. (2008). Islamic perspectives in human reproduction. *Reproductive BioMed Online, 17*(Suppl 3), 34–38.

Tzortzis, H. A. (2011). Embryology in the Qur'an: A scientific-linguistic analysis of chapter 23. *IERA Research. Islamic Education & Research Academy* (pp. 4–58).

Zahedi-Anaraki, F., & Larijani, B. (2011). *Stem cells: Ethical and religious issues.* In A. Rudnick (Ed.), Available from bioethics in the 21st century: http://www.intechopen.com/books/bioethics-in-the-21st-century/stem-cells-ethical-and-religious-issues. Accessed September, 2017.

Zahraa, M., & Shafie, S. (2006). An islamic perspective on IVF and PGD, with particular reference to Zain Hashmi and other similar cases. *Arab Law Quaterly, 20*(2), 152–180.

Zindani, A.-M. A., Johnson, E. M., Goeringer, G. C., Simpson, J. L., Moore, K. L., Ahmed, M. A., et al. (2000). *Human development as described in the Qurán and Sunnah: Correlation with modern embryology*. Riyadh: Makkah- A- Mukarramah.