

# Zoroastrians Support Oocyte and Embryo Donation Program for Infertile Couples

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## Abstract

**Background:** The main goal was to evaluate the attitudes and knowledge of Zoroastrians living in Iran towards oocyte donation (OD) and embryo donation (ED) program.

**Methods:** This cross sectional study consisted of 318 Zoroastrians (n=175 for OD and n=143 for ED) of both sexes. The questionnaire form comprised two parts of general demographic characteristics of the participants and twenty multiple-choice questions about attitude and knowledge of participants towards OD and ED. For statistical analysis, the chi-square test was applied for comparison of data generated from ED and OD groups.

**Results:** Majority of the participants supported OD (69.7%) and ED (71.3%) for infertile patients. In addition, 40% and 42% preferred donation program (OD and ED, respectively), compared to adoption. About 60% of the respondents believed that the donors have no right to find the child and claim it as their own. In addition, more than half of the respondents thought that the recipients of oocyte/embryo should never know the name and address of the donors. More than half of the participants did not know whether their religion accepts donation program or not. Approximately, 80% of respondents supported psychological counseling for both donors and recipients. Moreover, about 56% of the participants necessitated the advertisement on OD/ED program in the mass media.

**Conclusion:** Our preliminary data showed that Zoroastrians supported both OD and ED program equally for infertile couples.

**Keywords:** Embryo donation, Iran, Oocyte donation, Zoroastrians.

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## Introduction

Oocyte donation (OD) and embryo donation (ED) program started few years after introduction of *in vitro* fertilization (IVF) (1, 2). Women with premature ovarian failure, low quality eggs/embryos, reduced ovarian reserve, advanced age, hypergonadotropic hypogonadism, multiple failed IVFs as well as carriers of genetic defects and cases in post-menopausal stage are the main candidates for OD (3, 4). The right candidates for ED are also women with no/or poor quality oocytes, premature ovarian failure, gonadal dysgenesis or ovarian failure due to chemo/

radiotherapy, recurrent IVF failure, genetic diseases and women whose partners have severe male infertility (5).

From ethical perspective, OD is more acceptable because the ethical aspect is less arguable in comparison to ED (6). On the other hand, ED has had better outcome compared to OD from clinical viewpoint (5). Many factors may lead to postponement of childbearing (7). It is estimated that the demand for donation program would be increased in the future. As regards the case, cryopreservation of spare embryos has been routinely

used in assisted reproductive technologies (ARTs) and a large number of these embryos may never be used for infertile couples who have attained their desired children or who give up attempts in infertility treatment. These spare embryos are also potential sources for ED though the ethical problem of ED needs to be more elucidated (5). One of the most important issues on use of third party reproduction in ART would be attitudes and acceptance of both infertile couples and the society. Society's attitude could be important to modify the laws and each society may consist of different religions (8). Different religions may have different opinions regarding donation program (9), but the attitudes of general public in different societies and different religions towards this issue is still the matter of debate. There are several studies regarding the attitudes of Muslim people and Christians on the subject of OD and ED (10-12). But, some minorities may live in the society and the public should be respectful to their opinions and legislators should consider their points of view as well.

Zoroastrianism also called Mazdaism is the first monotheistic religion which was introduced more than 3,500 years ago by Prophet Zoroaster. Zoroastrianism is the oldest religion in ancient Persia (Iran) and was the main and official religion of Iranian people before Islam (13). Zoroastrians reside in parts of ancient Persia like Azerbaijan, Tajikistan and Southern Russia. They also migrated to other parts of the world such as USA and UK. It is estimated that about 200,000 Zoroastrians are living in the world. Zoroastrians are mainly settled in central regions of Iran, like Yazd and Kerman cities, with estimated frequency of 20,000 (14). Zoroastrians do not accept inter-religious marriages, also children of mixed marriages. In other words, Zoroastrianism encourages its followers to marry person with similar faith, although it is not an obligation. Also, they do not tend to have large number of children and average Zoroastrian couples have only one child (14). Marriage is recommended and admired in Zoroastrianism, whereas being unmarried, divorced and polygamy are big faults. Persuasion of adult men and women in marriage has been a part of custom in Iranian culture, especially in Zoroastrianism. Review of ancient literature shows that Zoroastrianism is the first purely ethical religion in the world.

To the best of our knowledge, this is the first report regarding Zoroastrians attitudes towards OD

and ED program. This cross sectional questionnaire-based study was designed to evaluate the knowledge and attitudes of Zoroastrians, the special ethnic group with long history, on different aspects of donation program in Iran.

### Methods

This cross sectional questionnaire-based study was done in 2012 in cities of Yazd and Kerman which contained the most Zoroastrians in Iran. The study population consisted of 318 adults (n=175 for OD, n=143 for ED) of both sexes which were willing to participate in this survey. The questionnaire form comprised two parts. Part one was about general demographic characteristics of the participants. Part two contained twenty multiple-choice questions about attitudes of participants towards donation which were based on and adjusted to previous works (11, 15). The data were compiled by PhD student in Reproductive Biology who worked as IVF practitioner at the authors' center. The participants were completely informed about the questionnaire prior to answering. This study was approved by our institute review board (Ref. 151). For statistical analysis, the chi-square test was applied for comparison of data generated from ED and OD groups.

### Results

**Demographic information:** 57.1% (n=100) and 54.5% (n=78) of the participants were female in OD and ED groups, respectively. About 65% of the participants were married, and 42.3% and 49% had children in OD and ED groups, respectively. Regarding educational level, around 60% of the participants were at graduate level of education. Also, most of participants were young and in reproductive age (Table 1).

**Knowledge and attitudes towards oocyte and embryo donation:** Of all, 79.5% and 85.5% (in OD and ED groups, respectively) believed that infertility is not a woman's problem. About half of the subjects were aware of OD and ED programs and there was no significant difference for level of knowledge and awareness between OD and ED respondents (Table 2). Majority of the participants supported OD (69.7%) and ED (71.3%) for infertile patients. Only a limited numbers of subjects (22.2% and 15.4% in OD and ED, respectively) knew friends or relatives who participated in donation program. 40% and 42% preferred OD and ED, respectively, compared to adoption. There was insignificant difference in the response be-

**Table 1.** The demographic characteristics of Zoroasterian participants

Characteristic	OD (n=175)	ED (n=143)
<b>Sex</b>		
Male	75 (42.9)	65 (45.5)
Female	100 (57.1)	78 (54.5)
<b>Marriage status</b>		
Single	61 (34.9)	50 (35)
Married	114 (65.1)	93 (65)
<b>Children</b>		
Yes	74 (42.3)	70 (49)
No	101 (57.7)	73 (51)
<b>Educational level</b>		
High school	12 (6.9)	9 (6.3)
Undergraduate	63 (36)	48 (33.6)
Graduate	100 (57.1)	86 (60.1)
<b>Age group (years)</b>		
18-29	93 (53.1)	79 (55.2)
30-39	36 (20.6)	27 (18.9)
40-49	26 (14.9)	19 (13.3)
>50	20 (11.4)	18 (12.6)

Values are shown as number (percentage)

tween the OD and ED groups regarding this question. Approximately, 45% of the respondents believed that remaining childless can affect their relationship with their spouses. Nearly, half of the respondents preferred to have children resembling themselves. 65.1% and 55.9% of participants (in OD and ED group, respectively) thought that environmental situation is more important than the genetic role in what an individual is. In addition, the vast majority of the respondents agreed that couples can love and care for an OD/ED child as much as a biological child. Lastly, almost 80% of participants believed that there were not any specific services for women who are seeking donation programs.

**Religious issue on donation program:** More than half of the participants did not know whether their religion accepts OD and ED program or not. Approximately, one-third thought that OD and ED are permissible by their religion.

**Disclosure to the child:** More than 80% of the subjects believed that information regarding infertility treatment with OD and ED should be kept between the couples and their doctors only. About 70% reported that the child born from OD/ED should not be informed.

**Objections towards OD and ED:** Most of the participants supported OD and ED (69.7% and 71.3%, respectively) as appropriate ways for infertility treatment. Also, about 40% of them

thought that adoption is not superior to OD and ED.

**Right of oocyte/embryo donor:** About 60% of the respondents believed that the donors have no right to find the child and claim it as their own. In addition, more than half of the respondents thought that the recipients of oocyte/embryo should never know the name and address of the donors.

### Discussion

**Knowledge and attitudes towards oocyte and embryo donation:** Certainly, one of the important factors which determine social attitude and acceptance of OD/ED program among people is the religious perspective. Some issues have been remained controversial in donation practice including whether oocyte donors/embryo recipient should be known or anonymous, age limit for recipients and secrecy or disclosure towards the resulting child (11, 16). There are three published studies investigating attitudes of different religions towards OD and ED in Iran (11, 12). In this survey, about half of the respondents were familiar with OD. This finding was similar to previous studies on Christians (46%) and Muslims (48%) (11). However, Isikoglu et al. (2006) reported that <30% of Muslim population in Turkey had some knowledge about OD (10). Certainly, the level of knowledge can be correlated with the level of education and about 60% of our respondents had graduate degrees. The data generated from this study showed that Zoroastrians strongly supported OD and ED as alternative methods for infertility treatment. Our data showed that 69.7% of the respondents supported OD. This proportion was in line with that of Christians (74%) and Muslims (59%) (11). Moreover, it should be kept in mind that awareness of society is expected to have increased recently about the details of third party reproduction via mass media. As shown in previous works (10-12, 15), people who are living in family-based cultures, with different religious backgrounds, support donation program. In such countries, family preservation is the first priority of couples and infertility can impact spousal relationship or even may lead to divorce (17, 18). From Zoroastrian view point, each Zoroastrian who reached puberty should marry and make family with love, kindness and affection (19). Majority of the participants believed that remaining childless can affect spousal relationship. So, 43.5% and 42.6% of them would enroll in OD and ED programs, respectively, if they had to do so.

**Table 2.** List of questions on participants background, knowledge and attitudes regarding oocyte and embryo donation

Question		OD (n=175)	ED (n=143)	p-value
1. Are any of your friend or family members affected by infertility?	Yes	38.2	39.1	NS
	No	61.8	60.9	
2. Do you think that infertility is a woman's problem?	Yes	12.5	9	NS
	No	79.5	85.5	
	Don't know	8	5.5	
3. Do you know what OD/ED treatment for infertility means?	Yes	52	48.2	NS
	No	22.8	30.8	
	Don't know	25.2	21	
4. Do you support the OD/ED program for infertile couples?	Yes	69.7	71.3	NS
	No	17.1	12.7	
	Don't know	13.2	16	
5. Have any of your friends or relatives had OD/ED treatment?	Yes	22.2	15.4	NS
	No	77.8	84.6	
6. Would your religion accept OD/ED for infertility treatment?	Yes	33.7	37	NS
	No	14.8	12	
	Don't know	51.5	51	
7. Do you think that it is better to adopt a child or to try and have one via OD/ED?	Yes	24	22.4	NS
	No	40	42	
	Don't know	36	35.6	
8. If you would remain childless, do you think that it would have an impact on your relationship with your spouse?	Yes	44	45.5	NS
	No	35.5	33.5	
	Don't know	20.5	21	
9. If you had an OD/ED child, would you inform your friends and relatives?	Yes	32	24.5	NS
	No	51.5	59.5	
	Don't know	16.5	16	
10. If you were childless, would you enroll in an OD/ED program to overcome your infertility?	Yes	43.5	42.6	NS
	No	20	21	
	Don't know	36.5	36.4	
11. It is important for me that my child looks like myself.	Yes	56	51	NS
	No	36	34.3	
	Don't know	8	14.7	
12. Recipients are usually concerned about whether a donor(s) may try to find the baby and claim it as her/their own. Do you think that the donor(s) has/have the right to do so?	Yes	23.5	20.3	NS
	No	60.5	60.8	
	Don't know	16	18.9	
13. If people need OD/ED, the treatment should be kept between the couples and their physician, only!	Agree	81.1	83.9	NS
	Disagree	18.9	16.1	
14. A child should never know that he/she is born as a result of OD/ED.	Agree	68.5	69.2	NS
	Disagree	31.5	30.8	
15. I think that genetics play some role in what we are; however, the way we are brought up (environmental influence) is more important.	Yes	65.1	55.9	NS
	No	14.9	22.4	
	Don't know	20	21.7	
16. I think that it is possible for parents to love and care for an OD/ED child as much as a biological child.	Agree	76.5	85.3	NS
	Disagree	23.5	14.7	
17. Do you think that the recipient of the oocyte/embryo should know the name and address of the oocyte donor?	Yes	29.7	23.8	NS
	No	54.8	58	
	Don't know	15.5	18.2	
18. Is it necessary to have psychological counseling for both recipient and oocyte/embryo donor(s)?	Yes	78.9	77.7	NS
	No	9.1	13.3	
	Don't know	12	9	
19. Only the women under age of ... should be the recipients of oocytes/embryos.	40 years	22.2	18.9	NS
	Under no circumstances	77.8	81.1	
20. Do you agree with advertisement on OD/ED program in the mass media?	Yes	56.5	56.6	NS
	No	25.1	19.6	
	Don't know	18.4	23.8	

Values are shown as percentage  
NS: not significant

The people who are living in different countries with different legislations on donation program may have the same opinion regarding this issue. For example, third party reproduction has been prohibited in Turkey, also reproductive travel has been banned recently (20), while it is legal in Iran. It is stated that the government in ancient Persia financially supported the people who decided to marry and have children. With this background, it would be rational to expect that the rate of OD and ED acceptance by the Zoroastrians be high. Also, infertility in such groups may lead to sharper decrease in population. So, high level of acceptance of third party reproduction treatment would be acceptable in such minority groups.

**Legislation and religious issue on donation program:** Among Islamic countries, only Iran has legislation on ED since 2003 (21). The laws are approved according to Islam in Iran and the people with different religions can act based on their religions, if they are not against the laws (22). In general, legislation can be affected by culture and customs along with religious perspectives. In this study, an attempt was made to find the Zoroastrians attitude on ED, while they know that ED is not prohibited in Iran. The respondents had positive attitudes towards ED as well, which was in line with Ghasemi et al.'s data (12). ED, as an effective and cost-efficient infertility treatment, could be one option to resolve the problem (16, 23). Although there is no genetic link between the child and both parents in ED program, the recipient carries the embryo until delivery and she is considered as the biological mother. However, the positive attitude towards OD is more acceptable because of genetic contribution of her husband. Nevertheless, Iran, as a Muslim country, has no legislation on OD and ED for partners and homosexuals and the public from such countries support the OD and ED as alternative methods for married infertile couples only. There are no other reports regarding society attitudes towards donation program from other Islamic countries. It has been stated that religion can affect OD and ED in different societies (24). Religion is defined as beliefs and opinions which are originated from the history of society that also can be a heritage. Because of different cultural backgrounds, the perspectives from different religions would be different. In Jewish perspectives, OD would be allowed if the donor is not married. From Christian's point of view, OD and ED are not allowed by Roman Catholic, Eastern Orthodox or Protestant (24).

There are some controversies regarding donation program in Islamic countries like Iran and Turkey. Donation is permissible in Shia branch of Islam in countries like Iran, and is prohibited in Sunni branch in countries like Turkey.

About half of the respondents did not know their religion perspectives regarding OD and ED. Regarding OD, the percentage is a little higher than Muslims and lower than Christians (11). Also Khalili et al. (2008) found that only less than 20% of IVF staff did not know their religion viewpoints on OD (15). The IVF staff are involved in donation program and it is expected to know the legislation and religious viewpoints, whereas the general public may feel that they do not need to know these perspectives. Usually people will find the religious guidelines when they face the problem. People who are seeking donation program try to find the permission of their religions in this issue. Ghasemi et al. (2007) reported over 39% of the infertile couples aged >30 years do not know whether their religion permit ED or not (12). These high proportions may be related to religious scholars who may not have enough information regarding third party reproduction. Also, this may indicate that public attitudes towards OD and ED are mainly based on culture and customs, not on the religious knowledge. People may have different religious backgrounds within a country, but they have the common opinions. Moreover, more than half of the respondents supported advertisement on OD/ED program in the mass media. Definitely, dialogue and advertisement on above issue in the mass media can improve knowledge of general public in different aspects of third party reproduction like OD and ED.

**Disclosure to the child:** One of the main concerns for the recipients in third party reproduction is that the donors may have emotional dependency to the donated oocyte or embryo. Our results showed that majority thought that the baby does not belong to the donor, and the donor has no right to claim the child which is in line with the findings of others (10-12, 15). Another important issue for legislator and society is the right of child born from OD and ED to know its origin. The majority believed that it should never be disclosed to the offspring that he/she is born as the result of OD or ED. Zoroastrians make decision based on wisdom. Indeed, they believe that individuals can consult experts or clergies and only each person can decide based on her/his wisdom. Attitudes towards disclosure have been the matter of debate world-

wide. In countries like Argentina and Sweden, there are positive attitudes towards disclosure to the child (25, 26). Also in UK, the respondents supported further relationship between oocyte donor and the child's family (27). Most of our respondents thought that the recipients should not know the name and address of the donors, and they supported anonymous donation. As previous works showed, in countries like Iran and Turkey, the public opinion is in favor of non-disclosure (10-12, 15). Perhaps one of the most important concerns for infertile couples would be the fear of being rejected by the child, if he/she finds out the truth. In addition, the vast majority of respondents agreed that OD and ED should be kept as a secret between the couples and their doctors. Also, more than half of the participants believed that they should not tell their relatives if they had OD and ED, because another concern for infertile couples would be the acceptance of the child by friends and relatives. So, it seems they fear that if others know the truth, they may not accept the offspring born as the result of donation program as their own biological child.

**Counseling for donors and recipients:** Routinely, most ART clinics offer counseling for infertile couples. In some countries like UK, the clinics should offer additional counseling for those using donation programs (28). Psychological consultation is strongly recommended for oocyte/embryo donors and recipients before finding the donor motivation, likelihood of success rate, drawing any plan for further contacts, finding probability of disclosure and helping the patients to make better decision (4, 5). Most of our respondents supported psychological counseling for both donors and recipients. Since, counseling is unavailable as a routine practice in the community, it is encouraged to have counseling for donors and recipients.

**Age limit for donation program:** Age limit for oocyte and embryo recipients is another matter of debate. From clinical point of view, one concern may be obstetric complications which are related to advanced age of recipients. But, it seems this group of patients is more prone to be excluded because of ethical instead of medical reasons (29). Most of our respondents believed that there is no age limit for oocyte/embryo recipients, in contrast to previous works (11, 12). According to our data, it is not fair to prevent the woman from having children, only because of her age, although it should be kept in mind that this group should un-

dergo a comprehensive medical and psychological evaluations (30).

One of the shortcomings of this study would be lack of data from all the Zoroastrians living around the world. They live in different countries that the OD or ED may be allowed or prohibited. It would be worthwhile to find whether their attitudes have changed according to environment and mass media or not. Also, it is necessary to design qualitative questionnaire studies in order to draw final conclusion regarding third party reproduction.

### Conclusion

Zoroastrians living in Iran supported both OD and ED programs equally for infertile couples as the last treatment. However, moral and ethical issues regarding third party reproduction as well as acceptance of these options by both society and patients should be addressed fully. Probably dialogue on donation program in the mass media can improve knowledge of general public with different religious backgrounds on different aspects of third party reproduction.

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### Conflict of Interest

The authors report no conflicts of interest, financial or otherwise.

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