



**Conception by Egg Donation:
Perceptions, Maternal Bonding and Health Practices**

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“Mother or Nothing” The Agony of Infertility

World Health Organization (WHO, 2010)

Abstract

Infertility is a condition that affects a significant number of couples around the world and Assisted Reproductive Technology (ART), which offers a range of possible treatments, is the most effective means to treat infertility. One of the key features of ART is conception by egg donation in which the child has no genetic link with the mother.

The aim of the present thesis is to examine how the Iranian (Eastern) and British (Western) public, as well as mothers (both Iranian and British) who have conceived a child by egg donation, differ in their perceptions of the consequences of children born by egg donation from psychological, social and medical perspectives (study1). Furthermore, it aims to examine how Iranian pregnant women who have conceived by egg donation differ in their maternal bonding and health practices from those who conceived naturally (study 2).

The sample group in study 1 consisted of 121 participants, 63 Iranian (Male = 26, Female = 37, Mean Age = 42.91, SD = 13.58) and 58 British (Male = 19, Female = 39, Mean Age = 32.36, SD = 14.02), in which 8 participants (4 Iranian and 4 British) were mothers with a donor egg child of primary school age. A 12-item questionnaire/statements was presented to the participants based on key reported literature on various scientific research findings on psychological, medical and social issues related to children born through ART. The participants were requested to respond to each statement by choosing one of the Likert scale options ranging from 1

to 4, Strongly agree, Agree, and Disagree to Strongly disagree. There was also an opportunity for the participants to write down additional comments in response to each of the statements about the reasons for their choice on each of the options. The process of data collection took 5 months to complete from January to May 2015.

Study 1 results were subjected to quantitative analyses for the Iranian and the British public and for the Iranian and British mothers who have children born as a result of egg donation. Furthermore, all written comments were subjected to content analysis.

The results showed that Iranian mothers with a donor egg child agreed more than their British counterparts (8 participants) that conception via egg donation might have psychological, social and medical problems for the resulting children due to a) lack of genetic link b) being unhappier than naturally born and c) might experience overt prejudice from the society.

Overall, study 1 found that men more than women and the Iranians more than the British were in agreement with scientific research that children conceived via egg donation have more medical, psychological and social problems than naturally born children due to lack of genetic link, being unhappier and experience more prejudice from their society.

Study 2 conducted in a hospital in Tehran aimed to explore maternal bonding between mother and fetus, and health practices in Iranian pregnant women via egg donation and naturally through the Maternal-Fetal Attachment (MFA), Fetal Health Locus of Control (FHLC) and Maternal Health Practices (MHP). The target group consisted of

21 Iranian women pregnant via egg donation (Mean Age = 32.42, SD = 4.48). For comparison, a sample of 50 women pregnant by natural conception (Mean Age = 28.06, SD = 5.45) was also recruited. The process of data collection initiated in January 2018 and concluded in May 2018.

The results showed women who conceived via donor egg, compared to women who conceived naturally, scored lower on the 4 subscales of MFA namely: Attributing characteristics to the fetus, Giving of self, Differentiation of self from the fetus and Interaction with the fetus. On the FHLC scale, women who conceived via donor egg, compared to women who conceived naturally, considered both Chance and Professionals/Powerful Others (External factors) as being more responsible for the health of their baby rather than Internal factors (or themselves). Finally, women who conceived via donor egg, compared to women who conceived naturally, scored lower on MHP indicating they paid significantly less attention to their health activities during pregnancy.

Overall, the results of the two studies are argued to make an original contribution to public perceptions of donor egg children and maternal bonding, and health practices of pregnant women who conceived by egg donation, in particular, in a culture such as Iran. It is hoped that practitioners and those involved in infertility treatment benefit from the results of the present study in giving the best advice to their patients. The limitations of the thesis, as well as recommendations and future directions, are discussed.

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Abbreviations

ART	Assisted Reproductive Technology
AI	Artificial Insemination
DI	Donor Insemination
DIT	Disruptive Innovation Theory
FHLC	Fetal Health Locus of Control
GIFT	Gamete Intra- Fallopiian Transfer
HFEA	Human Fertilization and Embryology Authority
ICSI	Intra-Cytoplasmic Sperm Injection
IVF	In Vitro Fertilization
MFA	Maternal-Fetal Attachment
MHP	Maternal Health Practices
WHO	World Health Organization
ZIFT	Zygote Intra-Fallopiian Transfer

Chapter 1

Overview – Synopsis

Overview – Synopsis

When Lazaro Spallanzani (1729–1799) successfully artificially inseminated a spaniel bitch he wrote “The success of this experiment gave me more pleasure than I have ever felt in any of my other scientific researches”, this action possibly the first example of In Vitro Fertilisation (IVF) dating back to several centuries ago shows the desire of mankind in the past centuries in understanding human assisted fertilisation (Clarke, 2006).

The present thesis, and the two reported studies conducted in the 21st century are attempts made to understand public perceptions of modern scientific research and maternal consequences of conception by egg donation, a topic that since the birth of the first test-tube baby in 1978 by IVF has been subjected to extensive investigation.

This chapter provides a synopsis of the current PhD with the view of a brief account of what has been covered in each chapter. The literature review and rationale behind the two studies are documented in chapters 2, 3 and 4. Chapters 5 and 6 are devoted each to the 2 studies reported in this thesis. Chapter 7 is a general discussion of the findings, the contributions, limitations and their implications. In what follows there is a more detailed account of what is reported in each chapter.

Chapter 2 is devoted to understanding infertility and the rise of Assisted Reproductive Technology (ART). The most credible definition for infertility is provided and updated regularly by the World Health Organization (WHO) which defines infertility “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse”. Infertility is and has been a worldwide problem, which has major social and

psychological consequences for the infertile couples (WHO, 2012). Looking back in time and how people defined infertility leads to the emergence of an interesting picture. Historically, in all ancient civilizations, women were blamed as the primary source for why a couple is infertile. For example, Hippocrates, the famous Greek physician who founded the Hippocratic oath blamed all kinds of things in a woman's body for preventing her from conceiving (Thorpe, 2015).

It took medical science many centuries of development and convincing evidence to change the view of an exclusively female cause to more balanced statistics in which both male cause and female cause could be the reason for infertility (Johnson & Everitt, 2000). Indeed, as explained in chapter 2 there are now well-established statistics on reasons for male and female infertility with still a reasonable proportion considered as “unexplained”.

Well over a century after the early attempts to achieve pregnancy via Artificial Insemination (AI), Louise Brown the first test-tube baby was born in July 1978 in Oldham and District Hospital in Greater Manchester (Davis & Loughran, 2017). The procedure of IVF raised the hopes of millions of previously untreatable couples to achieve conception by traditional means (Edwards, Steptoe & Purdy, 1980). The IVF excitement, however, was marred by very low success rate (around 6% in its early days) and relatively high costs for treatment (see e.g., Wang & Sauer, 2006).

Subsequent years, however, have seen a rise in the success rate of IVF treatment that resulted in a live birth to under 35 year olds 29% and over 44 years 2%. How successful IVF is will depend on many factors, in particular the woman's age and the cause of infertility (Human Fertilisation and Embryology Authority, 2018). Further

advancement and varieties of ART include Gamete Intra-Fallopian Transfer (GIFT) in which eggs and sperm (gametes) are isolated and transferred directly into the fallopian tubes by laparoscopy, and Zygote Intra-Fallopian Transfer (ZIFT) fusion of IVF in which embryos are transferred into fallopian tubes by laparoscopy (Squires & Kaplan, 2007) and introduction of Intra-Cytoplasmic Sperm Injection (ICSI) in 1992, in which a single sperm is injected into an egg for treatment of male infertility (Sandin, Nygren, Iliadou, Hultman & Reichenberg, 2013).

Collectively, the new medical advances also known as ART have provided more options for the couples that are unable to conceive (either because of what is known as the female cause or male cause, or both). However, the fact remains that success rate is still low, the costs are high and there are with all ART treatments certain complications such as ectopic pregnancies or miscarriage (Refaat, Dalton & Ledger, 2015). In addition, assisted reproduction became more controversial socially, culturally and ethically with the introduction of the third party into the procedure, namely conception via egg donation or sperm donation (see e.g., Golombok, Ilioi, Blake, Roman & Jadva, 2017).

The subsequent section of chapter 2 of the present thesis provides a more detailed account of the development of the advances in infertility treatment leading to the more controversial procedure of conception by third party involvement, namely egg donation. It is at this point that issues related to culture and religions have a significant interaction with infertility and ART treatments. As will be explained in chapter 3 many decisions about ART, and in particular with third party involvement, will inevitably cross pathways with religious beliefs and cultural practices.

Chapter 3 is devoted to exploring the role of culture, religion and their impact on assisted reproductive technology. It is important to make a distinction between culture and religion. Researchers have often used these two terms interchangeably. Whilst the main classification in most studies is on culture, attention should also be paid to specific religious commandments. Two individuals may have the same culture and yet practice different religions and with a varying degree of religiosity. Culture focuses on the human beings, which is its social heritage, while religion is associated with the Creator or the God of the whole universe. As Bonney (2004) maintained, culture is concerned with the evolution of humans and their beliefs and practices.

Researchers when studying cultural differences also make the distinction between Western and Eastern on various aspects of infertility (see e.g., Baluch, Manyande, Aghssa & Jafari, 1993; Bosdou, Kolibianakis, Tarlatzis & Fatemi, 2016; Greil, Slauson-Blevins & McQuillan, 2010). Another line of comparison is with developed, developing and the third world countries which inevitably ties with Western vs. Eastern classification. For instance, it has been reported that the main reason for having children in most ancient societies, and even up to modern day in the third world or developing nations, is that children are seen as a source of financial support and future breadwinners of the family (Touba, 1980).

Studies focused on Western vs. Eastern and in developed and developing countries and third world will be reviewed in chapter 3. The Collectivist and Individualist societies (countries), is yet another distinction that one could make in line with the Western and Eastern and third world, developing and developed countries. In collectivist societies, people belong to “in groups” that take care of themselves in exchange for loyalty, particularly as a community, family or nation more than as an

individual. Iran tops the list on that definition. In individualistic societies, people are supposed to look after themselves and their direct family only. Particularly, people are encouraged to do things on their own. Britain tops the list as an individualistic society. Such definitions may be seen as yet another reason for why people's attitudes, perceptions and behaviours about fertility and fertility treatment may be influenced by community members and family dictates (collectivist), compared to what people do because they are personally interested and not dictated to by "others" (individualist), see Greif (1994) for a review. However, there has not been any direct attempt to examine issues related to ART in line with the latter definitions, perhaps future researchers may consider the distinction as another approach to study public perception and behaviours towards ART.

Returning to religion and infertility, however, one may notice an interesting similarity across different faiths. The Judeo-Christian opinion of fertility is that fertility is a gift from God and infertility is a punishment for wrongdoing (Sewpaul, 1999). In Islamic scripture infertility is seen as a God-given impairment, thus, profound feelings of guilt may result from the inability to conceive and as a punishment from God (Inhorn, 2018). Adding to the already existing agony of what "sins" one has committed by not having a child, in Islam several phrases are aimed specifically at fertility which encourage couples, particularly women, about the significance of having a child. For example, "Marry and multiply for I will make a display of you on the Day of Judgment" a saying of the Prophet Mohammed (Inhorn, 1996, p. 222). In Christian faith, Rachel's agony of not being able to conceive is highlighted by her crying out to Jacob "Give me children or I shall die" (Holy Bible: Genesis, 30:1).

Thus, there is no surprise to see the extent of psychological trauma and social isolation that couples worldwide, and of different faiths, will go through if they are seen to be infertile, in particular, this psychological distress being still more on the shoulders of the woman rather than her male partner in spite of the statistics clearly showing that both male and female could equally be blamed for infertility. For example, women in most third world or developing countries blame themselves as being infertile (Inhorn & Patrizio, 2015). This is because men being the main source of income for the family may be seen as losing status in the society if deemed to be infertile. Thus, adding to the psychological and social pressures that women would go through regardless of which side is the source of infertility.

In view of the above, research has to take into account how cultural differences, religions and traditions cross pathways with ART treatments and its consequences. To understand the significance of why conception by egg donation could become so demanding, but equally controversial and worthy of extensive investigation, one has to look back at the significance of having children historically and in different cultures and religions.

Chapter 3 will provide a more detailed account of the significance of having a child, parenthood and adoption as the last resort for the infertile individuals, and the kind of psychological and social complications associated. It is thus concluded that due to such pressure to conceive, assisted reproductive technology gives great hopes but may bring with it certain complications, especially with the involvement of third party in infertility treatment, which is the main topic of the present thesis.

It is important to make a note here that the literature review here on various aspects of infertility and its impact on the couples, has emphasised the distinction of culture and religion. However, in the present thesis Iranian men and women all of Muslim faiths were the subjects of the investigation. It would have been ideal to have Iranian men and women of different faiths e.g., Christian or Jewish, so one could specifically look at the impact of religion on perceptions and consequences of ART but a) it was found a difficult task to find participants of different faiths to take part and b) in Iran whilst people are free to follow their religion, in most cases they have to obey the Islamic rule, for example, women must wear hijab in public regardless of their religion. It was thus inevitable that even if for the studies in this thesis men and women of different faiths were recruited, there would have been complications due to generalizability (sample size) and due to responses that are likely to be socially desirable rather than the participants' own beliefs (i.e., not to contradict with Islamic rules). Thus, religion per se was not a factor that was studied specifically in the present thesis rather the distinction in study 1 was between British (Western) and Iranian (Eastern) and in study 2 on Iranian women. All Iranian participants maintained that they are of Muslim faith, predominantly Shia followers.

Chapter 4 is a review in part of the psychological, social, medical, as well as ethical sides of children born by conception via assisted reproduction, egg donation and whether or not couples that opted to have a child via egg donation have truly fulfilled their aim. The review is looked at from different perspectives. One approach is based purely on scientific studies aimed at psychological, social and medical consequences of children born by ART. For example, Bonduelle et al. (2005) reported that children born as a result of ART have more childhood illnesses than naturally born. Wagenaar et al. (2009) reported that children born by ART are more socially withdrawn and

unhappier than naturally conceived. Zhan et al. (2013) reported that ART conceived children have lower IQ scores than naturally conceived.

Whilst such findings are of interest, there is still the question of what the public think about the new innovations in human reproduction (ART) and their consequences. This is because what scientists report may not be in harmony with what the public thinks. Does the public share the view that children born by ART or by egg donation have more childhood illness? Are they more socially withdrawn? Or have lower IQ scores? What would be the view of the mothers who have conceived by ART on the latter issues? To what extent do cultural differences play a role in public perception of the consequences of ART?

The Disruptive Innovation Theory (DIT), advanced by Christensen (1997) maintains that any new innovation may come into conflict with existing traditions and norms due to moral and ethical concerns. A “disruptive innovation” means, in business terms, any innovation that opens up a fresh market and creates a new value network. Eventually, it will undermine an existing market and value network and secure an advantage over existing products, firms and alliances. The first people to identify and investigate this phenomenon were Clayton M. Christensen and his team, working in the USA from 1995 onwards. No other business idea has made a comparable impact since then (Ab Rahman, Hamid & Chin, 2017).

Taking into account the premises of the above framework and linking it to human reproduction one comes across the three-century controversy surrounding the innovation of artificial insemination results from the innovations disruption of the socio-legal value of the family. Artificial insemination, although invented in the

eighteenth century, was rarely used until the 1930s and only legalized in the 1960s. Its application to surrogacy and its use by unmarried women extends the controversy into the twenty-first century (Bernstein, 2002). Moving to more recent times and the birth of Louise Brown via IVF, the public reaction was “mixed” and often shocking. The Tabloid Press calling it the advent of “Franken babies”. The Vatican warning that doctors (scientists) might find themselves struggling to contain the consequences of their actions and that not all scientific advances are for the good of humanity! (<https://www.independent.co.uk/news/health/test-tube-baby-40th-anniversary-world-first-reaction-ivf-louise-brown-a8454021.html>); <https://www.freethink.com/shows/wrong/season-1/beware-the-frankenbabies>).

Indeed, the growth of interest in new innovations and reproductive technologies stretches to recent times. Cohen, Daley and Adashi (2017) outlined disruptive aspects of reproductive technologies. Werner-Felmayer (2018) discussed how the new technologies and innovative procedures might have an effect on “the disruption of social and cultural norms” (pp.14). Such considerations also require exploring the extent to which the public are knowledgeable and have opinions about the new innovations in human reproduction.

The importance of identifying “lay” perceptions and misperceptions of scientific and technological developments, including those that relate to ART, has been discussed in several new lines of research (see e.g., Goldfarb, 2019; Hudson, Culley, Rapport, Johnson & Bharadwaj, 2009). In Iran, ART has shown rapid advancements with 72 IVF clinics (Tremayne, 2012) currently engaged in ART treatments. The question that has not been addressed, however, is that the perception of the Iranian public about the new innovations of human reproduction, in particular egg donation, from

psychological, social and medical perspectives. Would Iranians perceptions of ART be affected by their more traditional ways of life and deeply rooted in their collectivist attitudes? Especially compared to the individualist and Westernised British attitudes? Furthermore, little is known of what are the maternal bonding and health practices and consequences of children born by egg donation. The latter should be studied from the point of view of the public as well as mothers with children born by egg donation (now in their late primary school), and also pregnant women during their pregnancy via egg donation. Thus, most attention as far as the present thesis is concerned is the subject of conception by egg donation as one of the most controversial aspects of ART. There is still little research aimed specifically at the extent of public perceptions of children born as a result of egg donation in the Western societies, and none aimed at Iran with its unique traditional, social, ethical and religious constraints on conception by third party involvement. Most of the research that will be reviewed in chapter 4 is aimed at attitudes of men and women in different countries on ART with topics related more to the economical or practical aspects of ART. For example, should the government or the public pay for IVF treatment cycles (Fauser et al., 2019). No research has addressed what the public regards about scientific research findings of consequences of ART. This is what is aimed at in study 1 of the present thesis.

The follow up section in chapter 4 is about ART in Iran. In an Islamic society such as Iran religion is the key player in everyday affairs. Therefore, ART had to take its own time to be accepted by religious leaders. Whilst conception by egg donation was forbidden for many years, it was a more recent fatwa by religious leaders that gradually paved the way for Iranians to accept conception by egg donation.

Away from religious beliefs, the Iranians value family and family heritage and ancestral links. Having a third party to aid conception is thus seen as a last resort due to absolute desperation by many couples (Abbasi-Shavazi, Inhorn, Razeghi-Nasrabad & Toloo, 2008). Thus, this raises the question of what perceptions people in Iran have about conception by egg donation and possible consequences. Chapter 4 will review psychological, social and ethical consequences of ART in Iran with the view of leading to the significance of research focused on conception by egg donation. Chapter 4 concludes with summary and rationale for study 1 which is based on the Iranian and British publics' (men and women) perception of ART by egg donation and from the point of view of 2 groups of mothers (Iranian and British) who have a child born by egg donation.

The aim of chapter 5 is to report study 1 of this thesis investigating Iranian and British perceptions of children born by egg donation, as well as perceptions of mothers who have a child conceived by egg donation. Study 1 concerns the following key questions

- a) To what extent the perceptions of Iranians on medical, social and psychological aspects of children born by egg donation differ from the British (Western) respondents
- b) To what extent there is a difference between perceptions of mothers (Iranian and British) with a donor egg conceived child (now in their early teens) on medical, social and psychological aspects of children born by egg donation.

To achieve this, 12 statements were selected (after a pilot study on an original 17 statements) from the key controversies and scientific research findings on children born as a result of assisted reproductive technologies in which conception via egg donation is one of the features.

The 12 statements were presented to 121 participants in Iran and in the UK, 63 Iranian (Male = 26, Female = 37, Mean Age = 42.91, SD = 13.58) and 58 British (Male = 19, Female = 39, Mean Age = 32.36, SD = 14.02) in which 8 participants (4 Iranian and 4 British) were mothers with a donor egg child and whose child was in primary school. All participants were asked to respond on a Likert scale ranging from 1 to 4, Strongly agree, Agree and Disagree to Strongly disagree to each statement. For example, statements such as “Donor egg conceived children are at higher risk of autism than naturally conceived children” (Gao, He, Cai, Wang & Fan, 2017) or “Donor egg conceived children have lower IQ scores than naturally conceived children” (Zhan et al., 2013) (see Appendix A for all statements). Furthermore, the participants were invited to add any comment they wished in support of their choice.

The results of study 1 were subjected to quantitative analysis for the Iranian and British public and for the Iranian and British mothers who have children born as a result of egg donation. Furthermore, all written comments were subjected to content analysis.

The results showed that Iranian mothers with a donor egg child agreed more than their British counterparts (8 participants) that conception via egg donation might have psychological, social and medical problems for the resulting children due to a) lack of genetic link b) being unhappier than naturally born and c) might experience overt prejudice from the society.

The overall conclusion from the analysis of the 12 statements on 113 participants (Iranian and British men and women), not including 8 mothers with a donor egg child, led to the conclusion that:

a) The men (Iranian and British), agreed more than women that children conceived via egg donation, compared to naturally conceived, have more medical, psychological and social problems.

b) Overall, the Iranians agreed more than the British that children conceived via egg donation, compared to naturally conceived, have more medical, psychological and social problems.

c) The British agreed more than the Iranians that children should be told about the precise nature of their conception and genetic materials.

d) As explained, the above are general conclusions drawn from analysis of all the 12 statements responded to by the Iranian and British participants. The result of findings from each statement, however, is analysed and discussed separately in chapter 5 and in the general discussion. For example, on the statement 12 that “Teachers should be informed of which children in their class have been born by egg donation” it was found that the Iranians agreed more than the British with this statement. As discussed by Pir Jalian (2017) this has significant implications for educational practices.

The detailed content analysis of both the Iranian and British comments showed that Iranians believed that psychological factors such as mother’s stress during pregnancy, environmental issues such as problems at school, and biological concerns such as genetic inheritance are some of the key problems for a donor egg conceived child. Furthermore, Iranians had concerns about disclosure to people and to the donor egg child about the precise nature of their conception. Such concerns could lead to psychological, social and medical problems in children conceived by egg donation. However, the British showed that family relationship, lack of disclosure to children

about their biological origins and genetic factors were the most important issues that might cause psychological, social and medical problems for children born by egg donation

The overall analysis of the results of study 1 indicated that the Iranians have strong reservations about a child being born as a result of egg donation, due to lack of genetic links and how the society might react to such a child. It was argued that perhaps mothers who have gone through the process of having a child by egg donation (possibly due to cultural pressure of having a child) have nevertheless strong reservations about the consequences. This raised the question of whether this dissociation between feelings (negative feelings toward donor egg children and concerns about telling the child and other people about the child's biological origins) and actions (going through the process of having children via egg donation) may manifest itself in the maternal bonding and health practices during pregnancy. Therefore, study 2 reported in chapter 6 is aimed at investigating maternal bonding and health practices of Iranian pregnant women via egg donation and naturally through the application of the following questionnaires, namely Maternal-Fetal Attachment Scale (MFAS), Fetal Health Locus of Control Scale (FHLCS) and Health Practices in Pregnancy Questionnaire-II (HPQ-II - henceforth referred to as MHP), which were back translated to Persian language. The details of the 3 instruments are as follows:

a) Maternal-Fetal Attachment Scale (MFAS) (Cranley, 1981), measuring the degree of mother-fetus attachment, for example "I picture myself feeding the baby" with five subscales: Role-taking, Attributing characteristics to the fetus, Giving of self, Differentiation of self from the fetus and Interaction with the fetus.

b) Fetal Health Locus of Control Scale (FHLCS) (Labs & Wurtele, 1986), measuring women's beliefs about control over the health of the unborn baby for example "God will determine the health of my baby" with 3 subscales: Internal, Chance and Professional/Powerful Others.

c) Health Practices in Pregnancy Questionnaire-II (HPQ-II) (Lindgren, 2005), measuring women's health activities important to pregnancy outcome, for example, "Since becoming pregnant, I think I am practising a healthy lifestyle".

The sample group comprised of 21 Iranian pregnant women via egg donation recruited from a hospital in Tehran (Mean Age = 32.42, SD = 4.48) and 50 pregnant women who conceived naturally (Mean Age = 28.06, SD = 5.45).

The results showed women who conceived via donor egg compared to women who conceived naturally:

a) Scored lower on the 4 subscales of the MFA namely: Attributing characteristics to the fetus, Giving of self, Differentiation of self from the fetus and Interaction with the fetus.

b) Considered both Chance and Professional/Powerful Others (External factors) affecting the health of their baby rather than Internal factors or themselves on the FHLC scale and

c) Scored lower on MHP indicating they paid significantly less attention to their health activities during pregnancy.

Chapter 7 is the general discussion, conclusion, limitations, implications and directions for future research. Overall, the results of the two studies should make an original contribution to understanding the public perceptions of donor egg children and maternal bonding of children born as a result of egg donation. Indeed, the novelty of study 1 was from a cross-cultural perspective and from the point of view of mothers who have a child conceived by donor egg. In particular, in a culture such as Iran in which there is a major dilemma, which from one side puts pressure on having children but at the same time seems to dislike the idea of conception with lack of genetic links. Study 2 had the novelty of being the first study reported on maternal bonding, health beliefs and practices of Iranian pregnant women via egg donation and by natural. As with any sensitive research of this nature involving public and infertile women there is always difficulty in finding participants. Thus, some limitations may be raised about the findings and this has been discussed in the concluding part of chapter 7. Nevertheless, it is hoped that practitioners and those involved in infertility treatment will benefit from the results of the present study in giving the best advice to their patients and to tackle the agony of infertility with the best possible solution.

Chapter 2

Infertility and Assisted Reproductive Technology

2.1 Preface

This chapter is a detailed account of the definitions and statistics regarding infertility as a worldwide problem. However, to understand the roots of the problem, a historical review is made in which early conceptualizations would blame women solely as the cause of infertility. With medical advancements, it became much clearer that only one-third of the reasons for a couple to be deemed infertile could be female cause, with an equal percentage attributed to male cause, and the remaining due to the unknown factors. However, as will be reviewed here, there is still the difficulty of what exactly is the figure of infertility and to whom it should be attributed, especially regarding the developing and third world countries.

A general misperception is that it is the woman's fault to be infertile. Adding to this are the differences in primary and secondary infertility, age and cultural differences in the timing of having a family. Such is the case that makes it hard to have accurate statistics on infertility. As will be argued, the turning point to infertility treatment was the birth of Louise Brown, the first test-tube baby that led to the highly popular IVF treatment. Follow up medical advances led to a host of treatments generally known as ART. However, whilst the statistics of a successful treatment are still relatively low and the treatments are costly, it is the desire to have babies worldwide and in particular in developing and third world countries, that there is an ever-growing population of patients undergoing ART.

Chapter 2 further reviews the various procedures and options and their success rates. The focus will then be on conception via third party involvement, specifically via egg donation. However, as will be explained in this chapter, there are many

considerations, complications and hurdles to overcome before one can see a successful conception by egg donation. Follow up chapters of the present thesis will look at whether this is a happy ending to the long, costly and psychologically draining journey of infertility treatment, or simply the beginning of new problems for those involved with conception via egg donation.

2.2 Introduction

Infertility is a worldwide medical condition of the reproductive system defined as the inability of heterosexual couples to conceive within 12 months of unprotected regular sexual intercourse and with reported major social and psychological consequences for infertile couples (WHO, 2012).

Inhorn and Patrizio (2015) stated that the total worldwide population of infertile people is very hard to evaluate since it varies depending on the definition, i.e., based on the time duration involved in the failure to conceive and whether infertility is described as being female cause, male cause, both or the unknown. Hence, when considering infertility statistics worldwide it is often not clear whether the figure reported related to the women, men, couples or just only unknown factors! And as will be explained below the definitions of infertility varies according to primary or secondary infertility and in developing and developed countries.

It is estimated that the total number of infertile couples is now around 121 million worldwide (Inhorn & Patrizio, 2015). In the UK, Robertson et al. (2015) has reported that one out of every seven individuals are said to be infertile.

Adding to the problem is that even within a country different statistics are reported. For example, in Iran earlier statistics showed that the overall prevalence of lifetime primary infertility among couples was 24.9% (Vahidi, Ardalan & Mohammad, 2009). Follow up statistics showed a decline with 17.3% of the couples had experienced primary infertility during their married life (Kazemijaliseh et al., 2015). It seems that prevalence of primary infertility in Iran was higher than the worldwide trends of

infertility. What, however, should be noted here is the fact that in developing countries women are expected to have children at very young age. Thus, infertility is labelled to women at a very young age if they are not able to conceive which is another reason for differences in infertility figures between different countries (van Balen & Gerrits, 2001). The public perception particularly in non-Western countries seems to ignore medical statistics of what percentage could be male cause or unknown factor and the childbearing inability is almost always attributed only to “women” and that women are often blamed for infertility even if the cause of infertility does not relate to them (Berek, 2007).

2.3 Infertility, Primary versus Secondary

Infertility is divided into primary and secondary infertility. Definitions of primary infertility vary between studies. Primary infertility defined as “a disease of the reproductive system defined by the failure to achieve pregnancy after 12 months of regular unprotected sexual intercourse” (WHO, 2012).

Secondary infertility indicates the failure to conceive after a previous pregnancy (Inhorn & Patrizio, 2015). Internationally, most infertile people experience primary infertility (Adamson et al., 2011). In other words, primary infertility as “inability to have any live birth” and secondary infertility as “inability to have an additional live birth” (see e.g., Mascarenhas, Flaxman, Boerma, Vanderpoel & Stevens, 2012).

Although the developing world has high percentages of secondary infertility, primary infertility is a main concern in the developed world. The low primary infertility incidences in developing countries may be due to marriage and pregnancy happening

at a younger age than in the developed countries. The main reasons leading to the high secondary infertility rates in these countries are Sexually Transmitted Infections (STI) and medical interventions under unhygienic situations, especially post-partum infections (Lunenfeld & van Steirteghem, 2004).

2.4 Causes of Infertility

As explained before, causes of infertility may be related to the male, the female or to both spouses. In some cases, no explanatory cause can be recognized and the infertility is then named unexplained or functional or unknown. The main causes of infertility are known as ovulatory problems, blocked or damaged fallopian tubes, and poor quality or low quantity of sperm. These causes identified for 75-80% of all explainable cases of infertility (Johnson & Everitt, 2000). Consequently, treatment choices and success differ with the cause of infertility (Quaas & Dokras, 2008).

The main causes of infertility in the UK comprise of unexplained infertility (25%), ovulatory disorders (25%), tubal damage (20%), factors in the male causing infertility (30%), uterine or peritoneal disorders (10%). Approximately, in 40% of cases, disorders are found in both the man and the woman. Uterine or endometrial factors, gamete or embryo defects, and pelvic conditions such as endometriosis might play a role (National Institute For Health And Care Excellence, 2014).

2.4.1 Female Infertility

Fertility declines with age particularly in women. Female fertility is at its highest between the ages of 18 and 24 years whereas, it begins to decline after age 27 and declines at a greater rate after age 35 (Sudha & Reddy, 2013).

The most common reason of female infertility is ovulatory difficulties with differing severity. Some women ovulate irregularly or not at all. Fertilization occurs naturally in the fallopian tube. The second most common reason of female infertility is a tubal disease where one or both fallopian tubes have been damaged as a consequence of an infection or abdominal surgery. Other reasons of female infertility comprise endometriosis where the tissue that lines the uterus (endometrium) grows inappropriately elsewhere in the pelvic area causing damage and the formation of adhesions, which can impair the function of the fallopian tubes (Johnson & Everitt, 2000).

2.4.2 Male Infertility

Male infertility remains a “hidden” reproductive health condition, even though it contributes to more than half of all cases of childlessness worldwide (WHO, 2014). Inhorn (2012) argues that due to the genetic aetiology of many cases, male infertility is often impossible to prevent and difficult to treat, lasting over the course of a man's lifetime, even if he attempts to have children by changing partners. In other words, male infertility is a chronic reproductive health condition for millions of men worldwide, even though it is hardly acknowledged as such (see also Inhorn & Patrizio, 2015). Some statistics reported of male infertility to 50% of cases overall (Agarwal, Mulgund, Hamada & Chyatte, 2015).

2.4.3 Unexplained Infertility

According to the Practice Committee of the American Society for Reproductive Medicine (2006) unexplained infertility is declared once the results of a standard infertility assessment for both partners are normal (Quaas & Dokras, 2008). According to Human Fertilization and Embryology Authority (HFEA),

approximately, 32% of couples will be diagnosed with unexplained infertility after their diagnostic workup (HFEA, 2018).

2.4.4 Age-related Infertility

Sharma, Biedenharn, Fedor and Agarwal (2013) stated that the proportion of couples with no detectable organic cause of infertility increases with rising female age. This higher rate of unexplained infertility reflects the decreasing chance of conception with increasing female age. Many couples in developed countries, specifically those who are well educated, wish to delay reproduction until achieving their primary goals of their life (Practice Committee of the American Society for Reproductive Medicine, 2004).

The tendency to plan childbearing later in life may in part be influenced by insufficient understanding about the negative effect of how increasing female age may affect fertility. Lampic, Skoog-Svanberg, Karlström and Tydén (2006) surveyed a randomly selected sample of 222 female and 179 male Swedish academics and reported that both women and men had an excessively optimistic view of women's chance of conceiving after the age of 35. Similarly, in an Australian study of 152 women over the age of 37 who were looking for assisted reproduction techniques for their first pregnancy, nearly one in five stated being not completely aware of the adverse relationship between age and fertility (Hammarberg & Clarke, 2005).

The increase in having children at later ages has been reinforced not only by the increasing use of assisted reproduction but also by an increase in infertile patients who receive conception by egg donation (Hibino & Shimazono, 2014; Pinborg, 2019).

In contrast, in a country such as Iran, as Islam prohibits extramarital sex, any discussion of fertility focuses on married women. Once girls reach this biological threshold, they become eligible for marriage, regardless of age. However, female age at marriage had begun to rise by the 1970s. Mean age at marriage for women rose from 19.8 years in 1986 to 23.2 years by 2006. Scholars maintain that socioeconomic factors and culture have remained the main forces determining the age at marriage in Iran. Because the sexual union is strictly within the realm of marriage in Iran, women's age at first birth is highly correlated to the age at first marriage. Traditionally, great cultural pressure to have children early into the marriage made contraception use rare prior to first birth suggesting that age at first birth would also have been lower (Saadat, Chowdhury & Mehryar, 2010).

2.5 Assisted Reproductive Technology

Together with such high numbers of infertile people worldwide and the many causes of infertility as explained before, the news of the birth of Louise Brown the first test-tube baby was seen as such a relief to the millions of previously untreatable fertility cases (Brezina & Zhao, 2012). In this section, there will be a brief review of these medical advances each with its own specifications and in relation to particular causes of infertility.

The use of assisted reproductive technology has become increasingly routine in the recent years and to date over 7 million children have been born through these techniques (Pinborg, 2019). Assisted reproductive techniques include all fertility treatments in which the gametes (egg and sperm) are handled outside the human body with the aim of achieving a healthy conception (HFEA, 2011; WHO, 2012). Common

ART procedures include IVF with or without Intra-Cytoplasmic Sperm Injection (ICSI) and IVF with donor egg or sperm (Reproductive Donation) (HFEA, 2011; WHO, 2012). For more comprehensive review of different techniques of ART see for example, Pinborg (2019), Squires and Kaplan (2007), Soini et al. (2006) and Zhan et al. (2013).

2.5.1 In Vitro Fertilization (IVF) and Its Variants

The vast majority of ART involve in vitro fertilization, a process that includes removal of eggs from a woman's body (after a couple of weeks of prior medication), combining sperm and egg in the laboratory or outside the body (in vitro), and returning the fertilised egg called the embryo to the woman's womb. This process could be with the woman's own eggs and her male partner's sperm or with eggs or sperm from a donor (see e.g., Baluch, Craft & Al-Shawaf, 1992; Baluch, Manyande, Aghssa & Jafari, 1993).

Other variations of IVF include Intra-Cytoplasmic Sperm Injection (ICSI). This is a treatment variation within IVF in which each egg is fertilized directly by injecting a single sperm using a microscopic needle. ICSI first described in 1992 by Palermo and associates in Belgium (Palermo, Joris, Devroey & van Steirteghem, 1992) and is seen as the treatment of male infertility and allows infertility treatment for couples for whom conventional IVF is not an option. For example, men with sperm motility problems or very low sperm counts can now conceive a child with a partner when previously donor sperm would have been required for conception (Squires & Kaplan, 2007).

As mentioned previously it is estimated that nearly 7 million children worldwide have been born after conception with IVF (Pinborg, 2019). In the UK in 2011, 2% of all babies born were conceived through IVF (HFEA, 2012).

2.5.2 Reproductive Donation

Whilst the main subject of the present thesis is conception by egg donation (will be explained in more details in the next section) there are many variants of “donation” that have been used during the past decades and have been subject of controversy. One key controversy shared by all types of donation is the lack of genetic link with the mother or father or both. As explained above the use of donor gametes, or third party involvement either in the form of donor sperm or donor eggs, is commonplace in ART. When the mother’s egg and father’s sperm are used in IVF and the mother undergoes the pregnancy, the parents have both a genetic and gestational link to the child in the same way as parents of naturally conceived children. However, a growing number of children are being born through reproductive donation, i.e., by the donation of eggs (resulting in the absence of a genetic link with the mother), sperm (whereby the child lacks a genetic relationship with the father), embryos (when both donor egg and sperm are used) and surrogacy the hosting of a pregnancy for another woman (Richards, Pennings & Appleby, 2012).

Although some of the donation methods seem to relate to post IVF era, some date back to decades before. For example, the use of donor sperm can be traced to the 1800s (Murphy, 2009), known as Donor Insemination (DI) which is one of the oldest techniques in reproductive medicine and is a relatively straightforward procedure in

which semen is transferred to the vagina via syringe. In more modern times there is a considerable screening of sexually transmitted diseases and inherited disorders when using DI (see e.g., Owen & Golombok, 2009). Another form of reproductive donation is what is known as embryo donation. This is when a surplus of embryos left over from other treatments may be used for another infertile patient. In the United States alone, it is estimated that over 400,000 embryos are currently cryopreserved, which many of them will not be used by their genetic parents (Brezina & Zhao, 2012).

The ethical and moral issues surrounding how to deal with these surplus embryos have been the source of much debate. Such debates range from whether a leftover embryo of a previously infertile patient is suitable for use by others, to ethical issues of genetic links to the recipients. Furthermore, whether the embryo should be used for research purposes (see e.g., Paul, Berger, Blyth & Frith, 2010). Also, see Golombok, Murray, Jadvá, MacCallum and Lycett (2004) for other forms of donation conception including surrogacy and its variants.

2.5.2.1 Reproductive Donation: Key Issues in Egg Donation

2.5.2.1.1 The Procedure

Since 1984 with the introduction of egg donation it has been possible for a woman to become pregnant and give birth to a child to whom she is genetically unrelated. Conception by egg donation (oocyte donation) is now the answer to the problems of women suffering from diseases such as premature ovarian failure, impaired quality of eggs, loss of ovaries, ovarian dysgenesis or old age and demand for postmenopausal pregnancy (Inhorn, 2006a). Moreover, the demand for egg donors has been on the rise globally (Bracewell-Milnes et al., 2016).

However, as explained before with regard to the egg donation process, the donor of the egg will undergo the same procedure as IVF with the difference that when the eggs are ready and retrieved, the donor's task is completed. The eggs from the donor and the sperm from the recipient's partner are then transferred to the lab for fertilization. The resulting embryos are then implanted in the recipient's uterus (Lutjen et al., 1984). The child is therefore genetically related to the father/male partner but not to the mother. As the process of donating eggs undergoes the same process as if the person is undergoing IVF (e.g., involving self-administered injections to stimulate the ovaries, blood tests, ultrasound scans and surgery to remove the eggs from the ovaries) it is not something that all people agree to volunteer to. Also, there is the risk that the donor may herself become infertile as a result of donating their eggs (Woodriff, Sauer & Klitzman, 2014). Also, it is important to note that because egg quality declines with age, egg donation clinics generally do not accept donors over 30 and in particular should have no family history of hereditary diseases (Almeling, 2006).

2.5.2.1.2 The Success Rate and Prevalence

The success rate of conception by egg donation therefore would in large part depend on the age and medical background of both recipient and donor. The success rate thus is an estimated value and differs between clinics and countries and with growing scientific advancements it is bound to improve. Egg donation is particularly widely used in Western countries, for example, in the United States, with over 3000 live births resulting from fresh donor egg cycles started in 2015, of which 27% were twin births (Imrie, Jadva, Fishel & Golombok, 2019).

In the United Kingdom, over 1,400 babies were born following treatment with in vitro fertilization and donor eggs in 2016, with just over half of these cycles undertaken by

women aged 40 or over (HFEA, 2018). In Europe, the statistics reported in 2010, is that the number of egg donation cycles was 25,187, representing 4.5% of all the IVF/ICSI cycles. The International Committee Monitoring ART (ICMART) report on worldwide assisted reproduction data showed that one of the most notable trends is the constant increase in the number of egg donation cycles from 14,887 in 2000 to 36,272 in 2006 (Mansour et al., 2014).

The latest statistics show that for example in the USA, egg donation cycles, independent of recipient age, an average of 56% of transfers resulted in live births while only 37% of IVF transfers, resulted in live births, indicating that implantation rates are affected by egg age but not recipient age (Savasi, Mandia, Laoreti & Cetin, 2016). The chance of multiple pregnancies is reported 20-25% and the pregnancy rate is up to 48% in conception by egg donation (<https://americanpregnancy.org/infertility/donor-eggs/>).

Regarding the age limit for recipients, it varies between clinics and countries, for example, the Ethics Committee of the American Society for Reproductive Medicine (2016) after a review of existing literature, concluded that healthy women in the age range of 50-54 years who are well-prepared for parenting, are candidates to receive donated eggs.

2.5.2.1.3 The Costs

There are, however, other factors that one could consider regarding treatment via egg donation, one such factor is the costs associated with the treatment and whom should cover the bill? Would it be via the public funds or the individuals? In most countries,

particularly in the developing and third world, it is up to the individuals (Ombelet & Campo, 2007). In the USA, for example, the complete cycle of egg donation would cost ranging from \$37,000 to \$65,000 (<https://www.conceiveabilities.com/parents/parents-and-egg-donors/costand-fees/>) this is considering that the donor is not expecting any payment! However, the reality is different. There is indeed a shortage of women to donate their eggs. For example, the UK has been suffering from a shortage of egg donors causing long waiting lists for those seeking a donation. This has caused some patients to go abroad to find donor eggs and with fewer restrictions on legislations (Bracewell-Milnes et al., 2016) and thus, commerce in donor eggs is flourishing in other countries (Hibino & Shimazono, 2014).

2.5.2.1.4 The Donor

From a research point of view, scientists have been looking at attitudes of women towards egg donation and factors that may affect the change of these attitudes to donate. For example, Bracewell-Milnes et al. (2016) in a systematic review of psychosocial attitudes, motivations and experiences of egg donors, recipients and egg sharers reported that attitudes towards egg donation were positive from both a donor egg and recipient point of view. Research into the general population's attitudes towards egg donation has found them generally to be positive (Purewal & van den Akker, 2009; Skoog-Svanberg, Lampic, Bergh & Lundkvist, 2003). It is also evident from the research that a large section of women are willing to come forward as identifiable donors (Purewal & van den Akker, 2009). The question is why there is such a shortage of donors if the attitudes to donate are positive?

Pir Jalian (2013) found that a significant number of Iranian and British women would not be willing to donate their eggs when it was made clear to them what is involved in egg donation procedure i.e., risk factors. Pir Jalian argued that perhaps some of the women who agreed to donate in other studies, for example, Purewal and van den Akker's study, were not aware of the physical and psychological effects on the donor. For example, women who donate their eggs may become infertile themselves (see e.g., <https://www.eggdonoramerica.com/become-egg-donor/donor-egg-risks-complications>). It is not evident that this and other risks and complications were explained to participants when conducting research on attitudes to egg donation. Furthermore, as Baluch, Randhawa, Holmes and Duffy (2001) reported people usually give socially desirable answers to survey/questionnaires e.g., in relation to organ donation but in reality their action is different.

2.5.2.1.5 Donor Anonymity

Adding to the issue of costs and difficulty to find a donor is the issue of whether the donor is known or unknown to the recipient. Because of the issue of costs and finding a suitable donor, it is often common for friends or relatives of the female partner to donate their eggs which is an intra-family donation, whereby gamete donation takes place between family members or friends (Golombok et al., 2011). But the process of finding a donor is not as straightforward, and for this reason different types of donor-recipient relationships may be considered:

- a) Known egg donors (where the recipient knows the egg donor)
- b) Anonymous donors who are either volunteer donors (donating for “altruistic” reasons) or commercial donors (accepting monetary payment for donation)

c) Women who give a portion of their eggs during IVF to a recipient fertility patient in exchange for subsidized fertility care in an arrangement known as egg sharing (Bracewell-Milnes et al., 2016; Grtin, Ahuja & Golombok, 2012).

At this stage, another issue becomes of significance, the issue of anonymity of the donor, and whether or not to tell the child about his/her genetic links and if so, at what age? It is for this reason that in different countries there are different legislations to coordinate and monitor the process (see e.g., HFEA, <https://www.hfea.gov.uk/donation/donors/rules-around-releasing-donor-information/>).

In the UK, for example, legislation changed in April 2005 and now requires any donor of gametes used to treat other people to consent to the release of their identity to any offspring reaching 18 years of age (HFEA, 2004). These regulations allow offspring conceived as a result of gamete donation after April 2005 to request their donor's identity from the HFEA. The regulation does not permit the donors or recipients to learn each other's identities, either at the time of donation or subsequently.

This movement towards identity release has largely resulted from the recognition that access to the donor's identity could be of importance to the donor offspring (Scheib & Cushing, 2007). Previously, donor records were often destroyed to guarantee confidentiality (Curie-Cohen, Luttrell & Shapiro, 1979), which led to feelings of anger and frustration for the donor offspring about lack of access to important information, such as family medical history (Kirkman, 2004). Interestingly, however, and in line with the present thesis, is that a number of studies in the West have examined parents' reasons for their decision not to tell their child of the donor insemination (Murray & Golombok, 2003). The predominant reason was parents' concern that disclosure would upset their child and would have an adverse effect on

parent-child relationships. In particular, they fear that the child may feel less love for, or possibly reject, the non-genetic parent (Golombok et al., 2004).

Other considerations that were taken into account in parents' decision not to tell, include a desire to protect the mother or father from the stigma of infertility, concern about a negative reaction from grandparents, uncertainty about the best time of telling the child, and what information to give the child about the donor (Golombok et al., 2004).

2.5.2.1.6 Lack of Genetic Link

The other concern in families created by egg donation is lack of a genetic link between the mother and child. Studies on western parents have shown that they may feel or behave less positively toward a non-genetic than a genetic child. Fathers, in particular, have been predicted to be more distant from their child (Baran & Pannor, 1993). It has been argued that the child may not be fully accepted as part of the family and that the absence of a genetic tie to one or both parents may have a damaging effect on the child's sense of identity (Burns, 1987; Golombok, 1998).

In conclusion, conception by third party involvement (egg donation) is now growing worldwide with some degree of success; however, certain pre and post-delivery complications still are of concern to all parties, ranging from the availability of the donors to the relationship between donor and recipients and issues of secrecy and disclosure.

In the next chapter, there will be a review of psychological, medical and social aspects of infertility and infertility treatment via ART, in particular conception by egg

donation both on the couple involved, in the West, the Middle East and especially in Iran.

2.6 Summary of the Chapter

In short, infertility, a worldwide problem, has made significant advances both in terms of definitions and treatment options. Not so long ago most people would regard women as the main cause of infertility whilst the more recent statistics revealed a different picture with men as well as the yet unknown factor considered as other possible contributors.

It is the rise of ART that led to significant advances in treatment options for various forms of infertility. Whilst the statistics of a successful treatment are still not ideal and it continues to be too costly to undergo ART, it is the desire of millions of infertile couples worldwide to have a baby that overcomes any concerns of success rate or costs. One of the ART options is the conception by egg donation, which is third party involvement in the treatment of infertility. As explained in this chapter, this aspect of ART makes it more controversial and many factors such as cultural differences, issues of disclosure and confidentiality enter into the question. This begs for comprehensive scientific research to examine the impact that such actions may have for the couples, for the child born by donated egg and for the society that the child grows up in. Some of the main reasons why couples may eventually engage in this form of conception are reviewed in the next chapter. There will be a review of the worldwide urge to have children, the cultural and religious factors and the driving force for couples to aim for assisted reproduction, and in particular conception by egg donation.

Chapter 3

Culture, Religion and Assisted Reproductive Technology

3.1 Preface

“Mother or nothing: The agony of infertility” is what is echoed by WHO (2010). This is particularly true about many infertile women in developing countries in which they consider that without children their lives are without hope.

This chapter will review different cultural and religious perspectives on infertility and its consequences for the couples, and in particular for the women. Furthermore, the chapter will review what different cultures and religions, for example in the Middle East or Iran, think and advocate about infertility treatments, especially with regard to new medical advances.

It is important to highlight the distinction between culture and religion, although most have used them interchangeably. Whilst the main classification is on culture, there is also attention paid to specific religious commandments. Two persons might have the same culture and yet follow different religions. Culture emphasises on the human beings, which is its social inheritance, whereas religion is related to the Creator of the whole universe or God. In this respect, culture is concerned with the evolution of human beings and their beliefs and practices (see e.g., Bonney, 2004).

3.2 Introduction

As mentioned in chapter 2, infertility is acknowledged as a major health problem worldwide. The latest statistics on the prevalence of infertility in women of reproductive age have been estimated to be one in every seven couples in the western world and one in every four couples in the developing countries (Bosdou, Kolibianakis, Tarlatzis & Fatemi, 2016).

Greil (1991) stated that the experience of infertility is dependent on the sociocultural context, age, gender, occupation, social class and ethnicity. One of the most important parts of human life is to have children, and all societies value the birth of children and upbringing. However, the meaning and the importance of having children vary for different people and in different times (van Balen & Bos, 2009).

From the inevitable “How many children do you have?” to religious encouragements to “Multiply and replenish the earth” (Holy Bible: Genesis, 1:28), childless couples are reminded of society's expectations that they must have children. The stigma attached to infertility is countless. Some couples believe that divorce would be more socially acceptable than infertility (Wallach & Mahlstedt, 1985).

According to van Balen and Bos (2009) there exist different theories to explain the reasons why people choose to have children, for instance, theories about internal motives and rational choices. The motives for having children in Western societies are for individual reasons such as happiness, well-being and life fulfilment (see also Dyer, Mokoena, Maritz & van der Spuy, 2007; Eriksson, Larsson & Tyden, 2012).

The reasons for wanting to have children depend on the social context in which the individual lives. Both the individual's own desires and the expectations imposed by others are significant factors (Skoog-Svanberg, 2003).

The desire to have a child is also related to a desire to strengthen the relationship with one's partner. Children give parents the opportunity to experience and give and also validate the couple's emotional relationship. Having children was explained as "an opportunity to care about something", "an expression of love", enabling the parent to "grow as a person" and "have something to live for". Having children was considered as "a guarantee against loneliness" and "the meaning of life" (Skoog-Svanberg, 2003).

In a survey of a sample of 897 white married couples in the UK who did not have children, a range of reasons to have children were "biological drive", "raising a child would be fulfilling", "my partner would be pleased if I had a child", and "I feel it would make us a family" (Langdridge, Sheeran & Connolly, 2005).

According to Ulrich and Weatherall's study on women in New Zealand (2000), reasons for wanting children include motherhood as a natural instinct, as a stage in the development of a relationship and as "a social expectation". These were used to construct motherhood as physical, psychological and social completeness and fulfilment for women.

In Western individualistic societies, women choose to be childfree. In the West, involuntary childlessness is associated with easy access to new reproductive technologies, such as IVF, ICSI and surrogacy (van Balen & Bos, 2009).

However, in most non-Western countries, people who do not have children are still regarded as “failures” (Bos & van Rooij, 2007). In non-Western countries the situation is very different, couples are not recognised if they do not have children, and women especially are often treated badly if they do not have children. Indeed, there is also a tendency that fertility of a woman is acknowledged in a non-Western (e.g., Middle Eastern) society only if she gives birth to a boy. In most non-Western countries, effective infertility treatments and the new reproductive technologies are limited and available only to the higher class (van Balen, 1999).

3.3 Infertility and Parenthood in the Middle Eastern Countries

In the Middle East, the prevalence of infertility is expected to vary between 10% and 15% of married couples because of the high prevalence of, for example, post-partum infection, post-abortive infection, and tuberculosis (Serour, 2008). In a recent systematic review with meta-analysis of prevalence surveys in the Middle East and North Africa reported that in these regions the prevalence of infertility is high in 17.2% to 22.6 % (Eldib & Tashani, 2018).

The “Middle East” includes Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Pakistan, Palestinian territories, Oman, Qatar, Saudi Arabia, Somalia, Sudan, Syria, United Arab Emirates and Yemen. The Middle East, an area rich in history and tradition, is also a land of continuing economic and political struggle (Serour, 2008) and in 2016 the region had an estimated population of over 411 million (WPR, 2019).

Prevention and treatment of infertility are of particular significance in the Middle Eastern countries because as explained before a woman's social status, her dignity and self-esteem are closely related to her ability to have children. Childbirth and rearing are regarded as family commitments and not just biological and social functions. Furthermore, adoption as a possible solution to the problem of infertility is not widely accepted in the region of the Middle East for various cultural and religious reasons (Serour, Aboulghar & Mansour, 1995).

Middle Eastern countries are also described as "pro-natalist" referring to the high societal value placed on having children. Childbearing is viewed as an accomplishment of adulthood and brings happiness and fulfilment to a marriage (Inhorn, Birenbaum-Carmeli, Tremayne & Grtin, 2017). Couples are expected to bear children early in marriage, and children provide social status and security later in life (Inhorn, 2018).

As was noted earlier women have been historically considered to be the main cause of infertility. However, more noticeable is that in non-Western countries even if the woman is not the cause of infertility they often take the blame to avoid their male partner losing face in the society (Inhorn & Patrizio, 2015). Thus, no surprise that if a couple are experiencing infertility it is the female partner that suffers most. According to Serour (2002), women in an infertility situation are expected to be anxious, frustrated and suffer from grief, fear, marital distress and domestic violence.

3.3.1 Infertility and Parenthood in Iran

Infertility in Iran remains a major reproductive health problem and its prevalence is high. According to a study conducted in 28 provinces of Iran, lifetime primary

infertility was 24.9% in 10,783 women (Vahidi, Ardalan & Mohammad, 2009). Follow up statistics showed that 17.3% of the couples had experienced primary infertility during their married life (Kazemijaliseh et al., 2015).

In Iran, being infertile is likened to being “cold stove” and this is because having children is a social must and therefore not having children is frowned upon by religion and traditions. In the Iranian Family Protection Law, infertility can legally and religiously justify the termination of a marriage by divorce (Abbasi-Shavazi, Asgari-Khanghah & Razeghi-Nasrabad, 2005).

In addition, the position of motherhood is highly honoured and believed that “Heaven lies at the feet of mothers” (Bhatti, Fikree & Khan, 1999). The Iranian culture is child loving and family oriented and therefore places great emphasis on fertility. From the day one of marriage which, unlike in the West, happens at a very young stage of adulthood, through a cultural ritual, the woman is reminded that one of her roles is to be a mother (Baluch, 1992).

According to Iranian culture and context, childbearing is highly desirable, where an absence of children with a first wife may lead husbands to take a second wife with or without divorcing the first one. Having a child stabilizes the family and increases marital satisfaction. The desire to have a child in infertile women is due to “abuse”, “marital instability”, “social isolation”, and “loss of self-esteem” (Behboodi-Moghadam, Salsali, Eftekhar-Ardabilly, Vaismoradi & Ramezanzadeh, 2013; Eftekhar-Ardabilly, Behboodi-Moghadam, Salsali, Ramezanzadeh & Nedjat, 2011; Ramezanzadeh et al., 2004).

Both men and women, particularly men, speak often of their wish and desire to create lasting memories of them during life and after death. Children are considered as the memory of an individual who has left a trace on this earth. The famous saying as “the one with children is not dead” explains how men and women achieve a kind of personal endlessness after death. Children are even referred to as the “son and daughter of so-and-so”, especially after their parents' death. Therefore, for both men and women, having children gives an individual a proper name in life and also guarantees continuity of his/her name after death. All male and female children, furthermore, carry their father's family surname to future generations in a society that values patrilineal continuity (Saroukhani, 1993).

Happiness in life means having children, which is the other categorical reason for Iranian men and women to have children. Caring and having affectionate feelings for children are the general and popular rules among the parents. As a general rule among the parents, affection and concern for children is essential, and those individuals, primarily fathers, who are known to be oppressive, abusive, or uncommitted to their offspring, are seen as highly unusual human beings. They are likely to be rejected in the community and lose their popularity (Baluch, 1992; Saroukhani, 1993).

Overall, in different cultures the reasons for women to have children range from motherhood to natural instinct and to social expectations. In the Middle East and in Iran the social expectations and isolation are the most notable, followed by possible abuse and marital instability.

3.4 Assisted Reproductive Technology and Religion

The impact of religion on the handling of infertility reflects similarities across different religious groups. Across the Judeo-Christian religious faiths, infertility is seen as punishment for wrongdoing (Sewpaul, 1999). In Islamic scripture infertility is seen as a God-given impairment, profound feelings of guilt may result from the inability to conceive and perceived as a punishment from God (Inhorn, 2018). The individual's level of involvement with religion, their personal conception of God, and their sense of self in relation to God are important factors in influencing the impact of religion on the experience of infertility (Sewpaul, 1999).

In the Middle East, where the three major religions namely: Judaism, Christianity and Islam emerged; religion has the strongest influence on social behaviours, attitudes, practices and policy-making (Serour, 2000). The Jewish attitude to infertility treatment is based on the fact that the first commandment from God to Adam was “Be fruitful and multiply and replenish the earth and subdue it” (Holy Bible: Genesis, 1:28). Judaism allows the practice of all techniques of assisted reproduction when the egg and sperm originate from the wife and husband respectively (Schenker, 2005). Jewish religion does not forbid the practice of surrogacy, whether complete or partial, as indeed the practice is described in the Bible in the case of Sarah and Abraham with Hagar who bore Abraham a son, Ishmael, and Rachel, who used her slave girl Bilhah to bear a child for Jacob as indicated in Genesis 19 and 30.

In Christianity, although it permits all conventional lines of treatment of infertility, it forbids to its followers all practices of ART as they bypass the sexual union of man and woman. Although the Vatican does not accept ART, the Protestant and Anglican may practice it. Many protestant churches would allow ART with spouse gametes and

no embryo wastage. The Eastern Orthodox Church does not oppose ART for couples. However, gamete donation or surrogacy is not approved (Serour, 2006).

Interestingly, in contrast to Sunni Islam, Shia Islam accepts gamete donation and validates it. The Shia rules have opened the way to a third party donation via Fatwa from the Iranian jurist Ayatollah Ali Hussein Khomeini in 1999. This Fatwa allowed third party involvement including egg donation, sperm donation, embryo donation and surrogacy (Serour, 2005). According to this Fatwa, in egg donation the new-born would be considered to be the child of the person who collected the sperm (i.e., the husband) and the egg donor, as well as the surrogate (i.e., infertile) mother (Khamanei, 2004; Inhorn, 2006b).

The third party reproduction is based on the importance of maintaining the family structure and integrity among the Shia family. These guidelines and legislation played a major role in comforting patients and physicians. There has been, however, a significant shift in acceptance of ART. In the 80s infertility treatment was associated with secrecy, feelings of shame, doubt and even sometimes guilt, but in the 90s such feelings were replaced by openness about seeking infertility treatment and ART in particular (Serour, 2008).

According to most Muslim scholars, if ART is designated for a married couple as a necessary line of treatment, it is permitted during the validity of marriage contract, with no mixing of genes (Al-Hasani, 2006). If the marriage contract has come to an end because of divorce or death of the husband, ART cannot be performed on the female partner, even if using sperm from the former husband (Al-Hasani, 2006; Serour, 2005). In most Muslim countries, parenting of a donor child by a single

mother is unlikely to be socially acceptable (Inhorn, 2006b). The welfare of the resulting child is a primary concern, and the existence of a father is regarded as an important aspect in qualifying for the treatment (Larijani & Zahedi, 2007).

3.5 Assisted Reproductive Technology in Iran

Assisted reproductive technology was first introduced in 1984 in Iran and the first Iranian infant conceived by gamete intra-fallopian transfer was born in 1989 (Abedini, Ghaheri & Omani Samani, 2016). Indeed, the use of IVF in a range of contexts such as Pre-implantation Genetic Diagnosis (PGD) as a preventive measure for diseases with a genetic basis or for sex selection, sperm, egg and embryo donation, surrogacy, fertility preservation and animal conservation (freezing of egg, sperm and embryo) are commonplace in Iran. Important to note that no ART is allowed to single parents, homosexuals and non-heterosexuals (Tremayne & Akhondi, 2016). Thus, third party donation is only available to married couples. In other Muslim countries, where the majority of Muslims are Sunni, they do not allow third party donation in any form (Inhorn, 2006a).

3.5.1 ART by Egg Donation: Key Issues and Controversies

The important challenging issues in the field of third party reproduction consist of adultery, incest, and lack of biological descent. In Islam, reproduction outside of marriage is considered adultery (Zina), which is strictly forbidden in Islam. The other troubling aspect of third party donation is the potential for incest among the offspring of unknown donors. Similarly, third party donation confuses issues of kinship, descent, and inheritance. It destroys a child's lineage and leads to a "mixture of relations" (Inhorn, 2006b).

As Tremayne and Sheibani (2006) summarised the new techniques of ART, particularly third party reproduction, have given birth to a new form of kinship, which encompasses biological, medical, legal, religious, ethical and moral aspects. To highlight some of the concerns regarding ART is the lineage and inheritance. While the child takes its lineage (parentage, kinship) from both sides, it is the paternal side, which has dominance over the maternal. The following is what Tremayne and Akhondi (2016) have outlined regarding the complications of third party involvement and Islamic law. In the Islamic law, the primary significance of lineage is that of paternity, closely tied to legitimacy, through which a child acquires its legal identity and religion. Under Islamic law, inheritance rights are exclusively linked to biological relatedness and to marriage as between the wife and the husband.

The clear proof of blood relatives to inheritance is seen in the case of adopted children. Although adoption has been allowed in Iran for several decades now, the adopted child does not have an automatic right to inherit from his adoptive parents (Tremayne & Akhondi, 2016). The child belongs to its biological parent and inherits from them but takes its name from the adoptive or social parent (Sanei, 1998). Thus, the subsequent Fatwas and laws make a clear distinction between the biological parent and the carrier parent in the case of gamete donation and emphasize the priority of nature over nurture (Tremayne & Sheibani, 2006).

3.5.2 ART by Egg Donation: Legitimization

In Iran, in order to legitimize third party gamete donation, the suggestion was that of temporary marriage (Haeri, 1989), a uniquely Shia practice, which is similar to permanent marriage but has a time limit agreed between the two parties and can be

between one hour to 99 years (Makarem Shirazi, 2004; Tremayne, 2009). This would allow the infertile party to receive gametes from the donor, who would be the temporary spouse and therefore a legitimate donor. The gametes would then be fertilized on a petri dish, but without any bodily contact, taking place between the two parties (Khamenei, 1999; Sistani, 1999).

The issue of sperm donation is out of the question and the religion bans sperm donation and prohibited by law. Therefore, sperm donation is replaced by embryo donation (Alizadeh & Samani, 2014). According to the law, embryo donors should be married couples who are ethically and legally healthy and capable. Although gamete donation is legitimized in Iran, there is no possibility of egg donation by sisters, and recipients of donated eggs tend to conceal egg donation. The main reason for this concealment is concern about socially negative attitudes toward the ARTs methods when using donated eggs in Iranian culture, and this concern leads the couples to hide egg donation from family and friends in order not to lose their support and as a result they have to endure stress when using such techniques (Hadizadeh-Talasaz, Latifnejad Roudsari & Simbar, 2015).

Interaction with egg donors created both financial and psychological problems for infertile couples. Most donors donate eggs for financial gain. Women expressed concern over the interaction of their husband with egg donors. Because in Iran, the egg donor should be a widow or divorced woman yet this situation made the infertile women worry about the relationship between their spouses with donors and consequently made them frightened of the stability of their own marital relationship (Ebrahimzadeh Zagami et al., 2019).

Lack of support from the partner can make women's mental health worse during failed treatment and increase their stress. Likewise, men may feel left out of treatment cycles as the focus is largely directed towards the women. Although most women accept treatment because of the husband's great interest in the child, they feel guilty due to the infertility problem and fear divorce or remarriage of the spouse (Ebrahimzadeh Zagami et al., 2019; Ranjbar, Behboodi-Moghadam, Borimnejad, Ghaffari & Akhondi, 2015).

3.5.3 ART by Egg Donation: Donor Anonymity

In Iran the donor's personal information will be recorded and kept confidential, and every effort should be made to preserve donor privacy. Therefore, disclosure of the donor's identity requires judicial process or a court order (Larijani & Zahedi, 2007). The required rules of confidentiality often lead to the anonymity of the biological parent and thereby make it impossible for the child to know their identity and possibility of inheriting from them (Gooshki & Allahbedashti, 2015).

3.5.4 ART by Egg Donation: Costs and Success Rate

Although ART in Iran is expensive and not free to anyone under any conditions, the cost is relatively lower than neighbouring countries with better economic situations and stronger currencies. The relative cost differences encourage infertile couples from foreign countries to travel to Iran to undergo ART. In 2011, the average cost of IVF ranged from \$2250 to \$3600 in government and private centres (Abedini, Ghaheri & Omani Samani, 2016). In vitro fertilization is expensive and not subsidized by the Iranian state and more than 75% of IVF cycles in Iranian couples are unsuccessful (Ebrahimzadeh Zagami et al., 2019). The egg donation processes cost around \$7290

(1000,000,000 Rials Iranian currency) (personal communication). Currently most of these services are offered by the private clinics only. The Ministry of Health also plans to increase the number of infertility clinics in the public sector (Tremayne, 2012; Tremayne & Akhondi, 2016).

3.6 Adoption in the West and in Iran – Last Resort

Adoption is seen as a last resort for infertile patients and perhaps a source of psychological comfort is also deeply rooted in religious beliefs and cultural values. Thus, yet another important cultural factor may affect the infertile patients' option of finding a way to resolve their infertility problem (Greil, 1991).

According to Inhorn (1996), Islamic law legalized adoption and bringing up of orphans is a great act of charity encouraged by Islamic teaching, however, it is still not as widely practiced as it is in the West. There are also certain complications that make adoption a difficult process. For example, orphans cannot be officially “adopted”, because they cannot a) inherit from adoptive parents, b) receive the family name of the adoptive father if their own family name is known (or their family name has been chosen by the police), and c) be fully considered as the children of the adoptive parents. Adoption in Islamic law will be problematic unless the child keeps his/her own original name (Inhorn, 1996). Inhorn (1996) has even taken the complications due to adoption further and argued that those who practice the religion, view adoption as cheating, as changing God’s religion to raise a child not of their own and give him a name, and inheritance.

3.7 Psychological and Social Aspects of Infertility and Infertility Treatment in Western and Non-Western Societies

For most people, raising a family is part of their normal life expectancy. Failure to do so, or to have children when planned, can give rise to distress and causes people to re-examine their life's goals, which can be painful (Peddie & Porter, 2007). Thus, according to most researchers, infertility is a life crisis with a wide range of socio-cultural, emotional, physical and financial problems. This is argued to be in view of an inability to achieve "normal life" and what is desired by society (Galhardo, Cunha & Pinto-Gouveia, 2011; Greil, Slauson-Blevins & McQuillan, 2010).

As such one would expect some universality in psychological and social aspects of infertility. This is probably the case. For example, a considerable body of research in Western countries has shown that involuntary childlessness has strong psychological consequences (Galhardo, Cunha & Pinto-Gouveia, 2011; Greil, 1997; Greil, Slauson-Blevins & McQuillan, 2010). The most frequently mentioned effects are distress, raised depression and anxiety levels, lowered self-esteem, feelings of blame and guilt, psychosomatic complaints and reduced sexual interest. Similar reactions to infertility are also expected in non-Western and or Islamic societies but perhaps with different reasons for its manifestation. In relation to the theme of this thesis the emphasis is on the role of Islam and men and womens' psychological and social reactions to infertility.

In non-Western countries with predominantly Islamic rules, factors such as influence of religion, economical constraints and family planning may suggest different underlying reasons for psychological and social reactions to infertility. For example,

as mentioned earlier, in non-Western countries women often take the blame to be infertile even though it is a male cause. This is because the male partner may lose face in society if they are deemed to be infertile (Baluch, Nasserri & Aghssa, 1998). Interesting to note however, in most religious dominated cultures, in particular the Islamic societies, the male cause of infertility is seen as being God's will! So why would infertility be a problem for infertile men in an Islamic society? Inhorn (1996) argues that it is because infertility is seen as a God-given impairment that may interpret this as a punishment from God, thus, having profound feelings of guilt.

Indeed, as Baluch, Nasserri and Aghssa (1998) have reported, Iranian infertile men show a considerable degree of anxiety and depression, which is due to the fact that their status in the society is affected by their misfortune and perhaps their feelings of guilt! According to Nachtigall (2006), for Muslim couples, infertility may bring severe stigma and social isolation from their communities. Infertility also may cause marital discord, and some women from developing countries may experience domestic violence as a result of not conceiving. If one partner is identified to be infertile, the other partner's desire for children may lead them to leave their infertile spouse.

Consequently, it may be true to argue that in almost all cultural groups (Western and non-Western) infertility may be perceived as a crisis and the degree and nature of underlying reasons aggravating such a "crisis" may vary significantly across cultural groups. Another example of such differences is the extent to which the actual treatment of IVF affects couples psychologically. Studies on Western women show that IVF itself may produce considerable psychological distress (Edelmann, 1990; Inhorn, 1994; Miranda, Larrazabal & Laban, 1995). Baluch, Manyande, Aghssa and

Jaferi (1993) reported that in contrast, Iranian women might welcome any aspect of a stressful treatment (psychologically) insofar as their goal for conception is fulfilled. This is due to Muslims' religious ritual for self-inflicted wounding as a form of spiritual purity. In this respect undergoing stressful IVF treatment is seen as fulfilling this objective. Baluch et al. (1993) however, did not follow up to see if the women studied have been successful in their treatment. Recent studies show that infertility treatment is amongst the most stressful factors for infertile women if the IVF treatment is not successful (Ranjbar, Akhondi, Borimnejad, Ghaffari & Behboodi-Moghadam, 2015).

The implications of the above review are knowledge of social and psychological consequences of infertility from a universal and cultural specification would be a guide to practitioners and to public policies and the social sector programmes (Greil, Slauson-Blevins & McQuillan, 2010).

The next chapter is devoted to psychological, social and medical consequences of children born by assisted reproduction and egg donation. This is followed by the public perception and attitude towards ART and its consequences.

3.8 Summary of the Chapter

Cultures and religions differ in what they regard as being infertile and how to tackle the infertility treatment. Western cultures seem to consider women can choose to be childfree. In contrast, the views of the Middle Eastern, and Iranians in particular, tend to be towards blaming women for not being fertile. Regarding treatment options and especially with new advances, ART is accepted in nearly all its forms by Judaism, Hinduism, Buddhism, Christianity and Islam although most refuse third party involvement.

Thus, a case is reached in which couples have the dilemma of battling on the one hand with the urge to have children and on the other hand, the impact of cultural and religious commandments and norms. However, what is not taken into account is what happens to the offspring in different parts of the world once they have been conceived by ART, in particular by egg donation. This is the main aim of the present thesis. In what follows there will be a review of the literature of what are the possible psychological, medical and social aspects of a child born by ART, which has been more subjected to scientific research. The literature coverage then aims at psychological, medical and social aspects of a child born by egg donation, which has not been extensively studied. The final part of the next chapter is on public perception of a child born by ART and egg donation.

Chapter 4

Children Born by Assisted Reproductive Technology: Medical, Psychological, Social Consequences and Public Perception

4.1 Preface

As mentioned in previous chapters, ever since the announcement of the birth of Louise Brown, the first test-tube baby in 1978 via IVF (Step toe & Edwards, 1979), the evolution of ART has revolutionized the way people can now create new families (Brezina & Zhao, 2012). As mentioned in chapter 2, ART encompasses a variety of treatments including IVF (when egg and sperm are fertilized in a petri dish), ICSI (when a single sperm is injected directly into an egg), reproductive donation or third party involvement includes sperm donation (when a donor sperm is used), egg donation (when a donor egg is used), embryo donation or embryo adoption (when both donor egg and sperm are used) and surrogacy (when another woman carries the pregnancy).

In line with the medical advances in ART, there has also been a growing body of research examining psychological, medical and social consequences of children born by ART (see e.g., Golombok, Blake, Casey, Roman & Jadva, 2013; Golombok, Ilioi, Blake, Roman & Jadva, 2017; Pinborg, 2019). The results, however, were not conclusive, for example, some studies showed that ART conceived children experience a significantly higher risk of childhood illness, surgery, requiring medical care, and being admitted to hospital (Lu, Wang & Jin, 2013; Ludwig et al., 2009). In contrast, others have argued that most children born after ART seem to have turned out to be typical healthy children (Golombok et al., 2017).

This chapter focuses on research aimed at children born by assisted reproduction in terms of medical, social and psychological consequences and research aimed at public perception and attitude towards ART. The reason for such a review is not so much in

supporting or rejecting one version of the findings against the other, rather to highlight the kind of topics that have dominated scientific research on ART and its consequences, in particular after the Louise Brown era. For example, Bonduelle et al. (2005) reported that children born as a result of ART have more childhood illnesses than naturally born. Whether the latter is true or not is not the aim of this review. The aim is to provide a background for the questionnaire that was presented in study 1 (see chapter 5). The questionnaire consisted of 12 statements with items such as “children born as a result of ART have more childhood illnesses than naturally born”. This was then presented to the Iranian and British public as well as Iranian and British women who were affected by ART (egg donation) to see if they agree or disagree with the findings. The significance of such a finding is that practitioners could identify areas of “misconceptions” and try to tackle them by appropriate educational interventions. Furthermore, one could examine the extent to which factors such as cultural differences and the gender divide may affect public perception of consequences of ART and the extent to which they differ from those who had already experienced conception by ART (or egg donation). The format adopted in study 1 is therefore unique insofar as actual research findings on consequences of egg donation conceived children were presented to the public and mothers who conceived a child by egg donation for their perceptions and comments. However, there has already been a growing body of research assessing perceptions and attitudes of the public and infertile couples on various issues related to ART. For example, attitudes or perceptions about the costs and or definition of infertility, egg and or sperm donation.

A review will thus, be made of the reported studies on the latter issues in this chapter. One thing to note here is that the terms perception and attitude have been used interchangeably by the researchers and this is a noticeable issue when the reviews are

made. Is there a difference between perception and attitude? Some argue that there is a difference between the terms “perception” and “attitude” (see e.g., <https://www.reference.com/world-view/difference-between-perception-attitude-63f45c8509bb74e7>). In the author’s opinion, the main distinction is on the wording and aims of the study and what will be achieved from studies on “perception” or “attitude” about ART.

As mentioned above, there have already been a number of studies on public attitudes towards ART. For example, a very recent study in 2019, involving 6,000 participants in six different European countries, on IVF and gamete donation concluded an overall positive attitude towards both procedures (Fauser et al., 2019). The problem with this type of attitude survey study is that it consists of items such as: Would you/have you ever considered using IVF treatment? How much would you pay to have a child through IVF? Do you believe that IVF treatment should be available to single women without a partner? The answers provided by participants were simply to say “Yes” or “No” with little or no chance given for comments! Such costly surveys do not seem to answer some fundamental questions. In particular, the extent to which the participants surveyed have perceptions about possible psychological, social and medical consequences of children born by ART when responding to each item. Did any such “perception” affect their “attitude” when responding “Yes” or “No” to the survey? Thus, with such a method of assessing public attitude not much could be achieved. The statistics of what percentage agreed or disagreed with each item can be of little use to practitioners. This is because when the respondents surveyed gave their “Yes” or “No” answers, were they aware of, or had any perceptions of, scientific claims that a child born by ART (egg donation) may have an unhealthier life compared to a naturally born? Were the public surveyed aware of, or had any perception, that a child

born by ART (egg donation) may be unhappier than naturally born? These are questions that cannot be answered even with such large-scale surveys of 6,000 participants in six European countries! What is required is to confront the public with statements regarding what scientists have been investigating for decades and see what their perception is about such claims and to give their reasons for their answers. The benefit of this method of research is that a) it identifies the conceptions and misconceptions that the public (and those involved in ART treatment) may have about ART and try to minimise the gap between public and scientific research and b) it provides practitioners with valuable information to provide the best advice to those planning for ART and for educational programmes for the general public. The study 1 of the present thesis, reported in chapter 5, deals with the latter aims and objectives in mind.

In the present chapter, there is a review of psychological, social and medical consequences of children born by ART followed by studies that have either aimed at public perception or public attitudes towards ART.

4.2 Introduction

Since the birth of the first IVF baby in 1978, the use of ART has increased tremendously and 1.7%-4.0% of all children born in developed countries are conceived through the use of ART (HFEA, 2011) and in 2019 more than 7 million children have been born through assisted reproductive technologies (Pinborg, 2019).

Since the early reports in 1985, several cohort and case-control studies have reported increased risks of pregnancy complications, such as miscarriage, ectopic pregnancy, congenital anomalies, preterm birth, low birth weight, gestational diabetes and pre-eclampsia (having high blood pressure and protein during the second half of pregnancy) in ART pregnancies compared to naturally conceived pregnancies (see e.g., Bradbury & Sutcliffe, 2014; Dupont & Sifer, 2012; Isaksson, Gissler & Tiitinen, 2002; Pinborg, 2019; Zhu et al., 2016).

Perhaps one reason why conception by ART may end up with medical complications is the many facets and procedures that have to be fulfilled before, during and after any ART treatment. For example, Baluch, Craft and Al-Shawaf (1992) reported how infertile women undergoing IVF treatment were concerned about daily injections of hormones and the use of nasal spray followed by the pain of egg collection, embryo transfer and finally waiting for the results of pregnancy. In similar fashion when one examines each procedure in more detail e.g., IVF, IVF/ICSI or GIFT, there are reasons to believe that many factors are involved at different stages of the treatment that may have medical or even psychological impact on the mother and on her conceived infant.

Thus, the past few decades have seen a growing body of research on the health outcomes of children born through ART (see e.g., Golombok, Ilioi, Blake, Roman & Jadva, 2017; Helmerhorst, Perquin, Donker & Keirse, 2004; Ilioi & Golombok, 2014; Ludwig, Sutcliffe, Diedrich & Ludwig, 2006; Zhan et al., 2013; Zhu et al., 2016).

There are questions that remain outstanding regarding the use of IVF. Conflicting data exists about the risks of IVF on the developing embryos. Multiple studies have failed to find a clinically relevant association between IVF or embryo cryopreservation and adverse maternal or fetal effects. Other studies have suggested that infants of IVF pregnancies may be at a small but statistically significant increased risk for rare epigenetic, other abnormalities and antenatal complications (Brezina & Zhao, 2012; Zhu et al., 2016).

The use of hormonal drugs during pregnancy and embryo manipulation may also affect the long-term health of children conceived through ART (Chung et al., 2006; Dupont & Sifer, 2012; Zhu et al., 2016). Others have argued that the various artificial procedures (e.g., cultured embryos in the lab or freezing and thawing) during ART may have the impact that children born by ART might be exposed to greater health risks than naturally conceived children (Zhu et al., 2016), (See also Alexander & Salihu, 2005; Liu & Blair, 2002; Pinborg, 2019).

There are other concerns apart from what happens in the lab or the procedural aspects of ART that call for concern. American College of Obstetrics and Gynaecology (2004) list the following: Firstly, couples who require ART often are older (mean age of 33 years for women undergoing ART versus 27 years for women who conceive naturally) increasing the chances of genetic problems in offspring as well as

pregnancy complications, secondly, most couples turn to IVF because of infertility, which may itself increase chances of developmental problems in children because of pre-existing medical and genetic problems in the parent(s), thirdly, mothers who undergo IVF take a combination of fertility drugs before and immediately after the procedures, which may have effects on growing embryos, finally, more than 50% of IVF births are from multiple gestations, resulting in a large negative impact on developmental outcomes (see also Wenstrom, Elliot, Newman, Peaceman & Chahaun, 2004).

The next section addresses medical, psychological and social consequences of children born by ART and egg donation.

4.3 Medical (Physical) Consequences of Children Born by ART

As mentioned in the introduction to this chapter, the procedural aspects of ART may be a factor having impact, in particular medically, on the children born by ART. There is of course a host of research on the medical consequences of children born by ART (in all variants), which is not the scope of the present thesis. What, however, is covered in this section is to review examples of some of the lines of research in the medical consequences of children born by ART to highlight why it has drawn so much attention by scientists. For example, one such example is the argument that transferring more than one embryo significantly increases the rates of multiple pregnancies, which is argued to be associated with a higher rate of prematurity and low birth weights, carrying high risks of morbidity to the children.

Evidence suggests that even ART singletons are at elevated health risks, which may be due to the poor fertility history of the parents (see e.g., Fauser, Devroey & Macklon 2005; Golombok, 2003; Henningsen et al., 2011; Lu, Wang & Jin, 2013).

Sazonova, Källén, Thurin-Kjellberg, Wennerholm and Bergh (2011) argued that singletons conceived by ART are still at a higher risk of lower birth weight, younger gestational age, premature delivery, prenatal mobility, and hospital admission compared with naturally born singletons. Miles et al. (2007) found that ART born children around the age of 5-6 are on average taller than naturally born controls (also controlling for parental height). Generally, a child born from premature delivery is reported to be taller than controls. Thus, as most IVF born children are subject to premature delivery they are expected to be taller than naturally conceived. Whilst height may not be an issue of immediate concern, Ceelen et al. (2009) examined whether this increased height would lead to health risks in the future because evidence has already shown that the rapid weight gain (as a result of getting taller) during early childhood (1-3 years) in IVF children could be related to higher blood pressure levels.

Zhan et al. (2013) went further and attributed the higher rating of premature and lower birth weight in the ART group as a factor for the lower educational performance. However, Zhan et al. (2013) also argued that decent home environment might be a contributing factor to the better educational achievement. In addition to ART itself, the history of infertility or the infertile state of the parents (mother) at the time of treatment may contribute to the high risk of obstetric outcomes and birth defects (Hayashi, Nakai, Satoh, Matsuda, 2012; Lu, Wang & Jin, 2013; Romundstad et al., 2008).

Finally, there is also concern about the drugs used before, during and after ART treatment. According to Maheshwari, Pandey, Shetty, Hamilton and Bhattacharya, (2012) it is still not clear whether the drugs used for ovarian stimulation, the manipulation of gametes, the artificial environment for fertilization and the early embryo's intrauterine exposure to hormones, produce longer-term health risks for children.

In short, there are many reasons to be concerned about medical consequences of children born by ART. What is not clear is how much the public, as well as women with children conceived by ART or egg donation, agree with such consequences.

4.4 Psychological and Social Consequences of Children Born by ART

In a previous chapter, the psychological and social aspects of infertility and infertility treatment, particularly from the point of view of couples or infertile women representing different cultures was reviewed. The aim of the present review is on children born as a result of ART. The literature is vast and varied and is ever growing. In what follows some of the key findings are reviewed.

4.4.1 Psychological Consequences

There have been concerns that psychological disorders may be more prevalent in children conceived from IVF treatment (Beydoun et al., 2010). A study by Wagenaar et al. (2009) of parental and teacher observations reported that more IVF children 9-18-year-olds (mean age 13.6 years), compared to naturally conceived, scored in the

borderline/clinical range on the syndrome scale withdrawn/depressed behaviour compared with their spontaneously conceived counterparts. Hart and Norman (2013) in a systematic review of the longer-term mental health and development consequences of birth resulting from IVF treatment, suggested that there is an increase in the prevalence in early adulthood of clinical depression, attention-deficit disorder and binge drinking on IVF born children.

Zhan et al. (2013) argued that ART children are at greater risk of autism due to parents' age, which are on average higher than naturally conceived children. Golombok, Owen, Blake, Murray and Jadva (2009) in a research on parent-child relationships and the psychological well-being of 18-year-old adolescents conceived by in vitro fertilization, concluded that adolescents born through IVF have lower self-esteem than the naturally conceived group.

Sutcliffe, Melhuish, Barnes and Gardiner (2014) found significant differences between ART born children and control in the rate of hospital admissions before the children were 9 months old, with the ART group showing higher rates of hospital admission. However, children born after ART had comparable health and development beyond 9 months of age to their naturally conceived peers. These results suggest that artificially conceived children have as good prognosis as other children with respect to the health and well-being related outcomes. This is in line with a previously published study in which older ART born children seem to show no psychological problems compared to naturally conceived children. Murray, MacCallum and Golombok (2006) studied 17 egg donation families, 35 donor insemination families, and 34 IVF families with a 12-year-old child, they found that

egg donation children showed no evidence of psychological problems and no differences were found between the egg donation and IVF families.

Golombok, Blake, Casey, Roman and Jadva (2013) examined parenting and children's adjustment in 30 surrogacy families, 31 egg donation families, 35 donor insemination families, and 53 natural conception families. Children's adjustment was assessed at ages 3, 7 and 10 using the Strengths and Difficulties Questionnaire (SDQ) and the results indicated that children born through reproductive donation obtained SDQ scores within the normal range. The follow-up study at age 14 showed there were no differences between adolescents themselves in terms of adjustment problems, psychological well-being, and self-esteem (Golombok, Ilioi, Blake, Roman & Jadva, 2017).

Zhan et al. (2013) stated that one possible reason for studies reporting no difference or a significant difference between ART and naturally conceived in psychological factors might be due to evaluation measurements and the sample size. Furthermore, it could be due to cultural differences (e.g., Pir Jalian 2017). There is of course a possibility that the child's difficulties might have been under-reported, especially by reproductive donation mothers who may have wished to present their children in a positive light (Golombok, Blake, Casey, Roman & Jadva, 2013).

4.4.2 Social Consequences

A study conducted in Israel has found a higher incidence of emotional problems among IVF children. In a comparison between IVF and naturally conceived children of middle-school age on measures of school adjustment, hyperactivity, trait anxiety,

depression, aggression and behavioural problems, the IVF children, particularly the boys, were found to show poorer adjustment to school as rated by teachers and reported themselves to be more aggressive, more anxious and more depressed (Levy-Shiff et al., 1998). Other researchers have indicated that children born as a result of IVF may be more hyperactive (Beydoun et al., 2010) and are more likely to be expelled from school (Zhan et al., 2013).

Ponjaert-Kristoffersen et al. (2004) argued that children conceived via ART might be liable to a reduced IQ. In line with the latter claim an age-matched study by Knoester et al. (2008) observed a slightly but significantly reduced IQ in 5- 8-year-old children born after ART. Evidence on lower IQ scores in ART born children is also reported by other researchers (see also Bowen, Gibson, Leslie & Saunders, 1998; Ponjaert-Kristoffersen et al., 2004; Zhan et al., 2013).

Furthermore, the social recognition and acceptance of these families, their social context and the processes through which social environment affects family relationships are issues of concern (Colpin, Demyttenaere & Vandemeulebroecke, 1995). It is important to emphasize that negative attitudes may exist towards reproductive technologies, with procedures such as IVF and donor insemination sometimes considered being immoral or unnatural. As a result, families with a child conceived by assisted reproduction may experience overt prejudice not only from the wider community but also from relatives and friends (Fasouliotis & Schenker, 1999; Golombok, Cook, Bish & Murray, 1995).

Gibson, Ungerer, Leslie, Saunders, and Tennant (1998) indicated that children conceived through IVF techniques might suffer potential psychosocial risks, as well

as being more at risk through psychological maladjustment. Also, the study of Gibson et al. (1998) reported lower scores on receptive language skills in IVF infants.

In short, research on psychological and social consequences of ART born children is flourishing with some mixed results. What, however, is the main focus of the present thesis is not to dispute or support the findings on psychological, medical and social consequences of children born by egg donation. The main aim is to examine the perception of public (men and women) and mothers with a donor egg child in two contrasting cultures of Iran and the UK on “children born by egg donation”. However, little or no research is aimed specifically at the extent that the public (or those involved in ART treatment) share the same or different views on consequences of ART with the scientific research findings. Thus, a different approach would be to examine research that has mainly addressed the attitudes and or perceptions of participants in different countries on various aspects of infertility and ART treatments.

The next section will be focused on studies that have reported to this date on examining the public attitudes and how the public perceive various aspects of assisted reproductive technology.

4.5 Assisted Reproductive Technology, Disruptive

Innovation Theory and Public Perception

Assisted reproductive technologies have raised a number of ethical and moral concerns. As Pir Jalian (2020) argued medical ethics has to play a role in how professionals consider the benefits to the patients, as opposed to the desire to conceive

by whatever means. The question that medical professionals may have to consider is the extent to which new medical innovations (in particular, conception by egg donation) may cross paths with cultural norms, traditions and religious beliefs. This is particularly true in a country such as Iran with deeply rooted religious beliefs, significance of genetic links, and living in a collectivist society in which people belong to “in groups” that take care of themselves in exchange for loyalty, particularly as a community, family or nation more than as an individual. Thus, what actions people take will be of concern to others (<https://www.psychreg.org/factors-to-consider-in-assisted-reproductive-technology/>).

Ethical issues, especially medical ethics of ART and egg donation, include the risks of multiple pregnancies and the use of selective abortions, lack of biological relatedness or genetic link in sperm and egg donation and surrogate mothering (Macklin, 1991; Stacey, 1996; Rebar & DeCherney, 2004). One set of ethical issues concerns the impact on offspring, on participants, and on the family of rearing arrangements that separate female genetic and gestational parentage. Another set of issues includes obtaining consent, risk, and commercialisation in gaining donor eggs (Robertson, 1989). The right to privacy of the recipients and the donors might be in conflict with the right of the child to know his/her origin. Confidentiality, disclosure to the child and protection of privacy are key ethical issues accompanied by profound legal, religious, social and cultural questions (Larijani & Zahedi, 2007).

The use of donor eggs, especially, creates ethical issues because of its separation of female genetic and gestational parentage and the relative shortage and unavailability of eggs. The other ethical concern related to egg donation is that it separates sex and

reproduction or introduces a third party into the marital relationship (Robertson, 1989).

The disruptive innovation theory, advanced by Christensen (1997) maintains that any new innovation may come into conflict with public perceptions due to existing traditions and norms. Not all innovations can be categorized as “disruptive”, although, they might be revolutionary in other ways. At the end of the 19th century, for instance, the appearance of the automobile might have appeared “revolutionary”, but, since it was restricted to the luxury market, it failed to impact the trade in horse-drawn vehicles. The transport market thus survived intact until the arrival on the scene of economically priced Ford Model T cars in 1908 (Christensen & Raynor, 2013).

The concept of “disruptive innovation” is now being applied in many fields outside that of business. Christensen and his colleagues have suggested ways it can be applied to intractable social problems such as unemployment, illiteracy, poverty and unavailability of health care (Hart & Christensen, 2002). However, the theory has taken off to such an extent that Christensen now questions some of these more recent applications (King & Baatartogtokh, 2015).

Taking the basic premise of disruptive innovations theory into account, the three-century old controversy surrounding the innovation of artificial insemination resulted in disruption to socio-legal and religious values, and beliefs of the family. Artificial insemination, although invented in the eighteenth century, was rarely used until the 1930s and only legalized in the 1960s. Its application to surrogacy and its use by unmarried women extends the controversy into the twenty-first century (Bernstein, 2002). Moving to more recent times and the birth of Louise Brown via IVF, one can

see how the new innovations have crossed pathways with the existing norms and traditions and religious beliefs. As mentioned in the earlier sections of the thesis this led to negative reactions by the press and the Vatican!

(<https://www.independent.co.uk/news/health/test-tube-baby-40th-anniversary-world-first-reaction-ivf-louise-brown-a8454021.html>;

<https://www.freethink.com/shows/wrong/season-1/beware-the-frankenbabies>).

The initial public reaction to the first test-tube baby due to moral, ethical and religious concerns (see chapter 3 for detailed discussion over issues of religion and ART) is perhaps not surprising, as explained by disruptive innovation theory. DIT fits nicely with the latter, which maintains that any new innovation (especially of a sensitive and debatable nature) may come into conflict with public perceptions due to existing traditions, norms and religious beliefs. This is captured in recent articles by Cohen, Daley and Adashi (2017) and Werner-Felmayer (2018) in which, the extent of disruptive aspects of the new technologies and innovations, in particular from a cultural and social perspective, have been discussed. An understanding of public perception of innovative technologies is thus of prime interest from a research point of view. It is thus under the umbrella of studying “public perception” that one can examine the extent to which any new innovation has been accepted or absorbed by the general population. The importance of identifying “lay” perceptions and misperceptions of scientific and technological developments, including those that relate to ART, has been discussed in several new lines of research (see e.g., Goldfarb, 2019; Hudson, Culley, Rapport, Johnson & Bharadwaj, 2009). It has been stated “Lay people can address complex social and ethical questions without a full and detailed understanding of the technical processes involved” (Kerr, Cunningham-Burley & Amos, 1998, p 46). With regards to infertility and ART, Jensen and Jensen (1993)

stated that people with strong religious beliefs tend to be more traditional in lifestyle choices, gender ideology, and marriage and family patterns. Singer, Corning and Lamias (1998) reported that the more religious tend to hold more conservative views and perceptions towards issues such as genetic testing and a prenatal test for themselves or their spouses. In Iran, as mentioned before, ART has shown rapid advancements with 72 IVF clinics currently engaged in ART treatments (Tremayne, 2012). However, little is known by the public regarding using donor gamete and there is not a clear understanding of consequences of these methods and children born by egg donation. Considering that in a collectivist country such as Iran the public perception plays an important role in infertile couples' decision-making and it has an impact for their actions regarding infertility treatment, would Iranians' perceptions of ART be affected by their more religious, traditional ways of life and their deeply rooted collectivist attitudes, especially compared to the individualist and Westernised British attitudes?

There have been a number of reported researches on public perception/attitude towards infertility and ART, mainly in the Western world. Some of the more current studies are summarised below:

4.5.1 Assisted Reproductive Technology and Public Perception in Western Countries

In a survey on the public perception (n = 8194) of infertility and its treatment conducted in six European countries and in the USA and Australia it was found that only 38% of people surveyed considered that infertility is a disease and not accepting the medical opinion and definition of infertility. The results also showed that there is

little awareness of definition and incidence of infertility despite the fact that half of the people surveyed claimed to know someone affected by infertility. Over 90% of participants surveyed had knowledge of IVF but very few knew the chances of success. There were also very little knowledge about the costs of IVF cycle treatments (Adashi et al., 2000).

As mentioned above, Adashi et al. (2000) reported that the public are not very knowledgeable about ART. However, on the subject of attitudes towards IVF and gamete donation, a survey in 2019 (n = 6,000) conducted online, with participants living in France, Germany, Italy, Spain, Sweden and the UK, found a positive attitude among respondents toward IVF, gamete donation, and support for public funding for fertility treatment (Fauser et al., 2019).

In Canada, a qualitative study of Ottawa university students' awareness, knowledge and perceptions of infertility, infertility risk factors and assisted reproductive technologies indicated that participants were generally familiar with infertility as a biomedical health problem, could identify sex-specific risk factors but overestimated fertility of women in their thirties and ART success rates (Sabarre, Khan, Whitten, Remes & Phillips, 2013). Reproductive health knowledge gaps and confusion of the physiological life-stage of menopause with infertility were apparent. Most participants would pursue in vitro fertilization or international adoption in the event of personal infertility. Some participants wished to use a "natural" approach and were concerned with the potential side effects of ART-related medications (Sabarre et al., 2013).

In Sweden, a study investigated women's attitudes towards ART. From 2,000 randomly selected Swedish females aged 30-39 years, 94% were positive towards oocyte (egg) cryopreservation for medical reasons. 70% considered that this treatment was also indicated for social reasons. 76% found it acceptable to offer ART to single women. Uterus transplantation was found to be more acceptable than surrogacy (80% vs. 47%) (Wennberg, Rodriguez-Wallberg, Milsom & Brännström, 2016).

A study in 2013 was conducted to assess the attitudes towards aspects of embryo donation in a randomized sample of 1,000 Swedish women and men of reproductive age. A majority of the respondents (73%) were positive towards embryo donation. 75% agreed that it should be possible to donate embryos to infertile couples. Around half of the participants (49%) supported embryo donation to single women. A majority of the participants emphasized that demands should be imposed on the recipient's age (63%), alcohol addiction (79%), drug addiction (85%), and criminal record (67%), 47% of the respondents agreed that the recipient should be anonymous to the donor, and 38% thought that the donor should remain anonymous to the child (Wånggren, Prag & Skoog-Svanberg, 2013).

In Lithuania, a research on fertile and infertile women found that fertile respondents were statistically more likely to believe that the IVF procedure should be applied only to married couples or women who had a regular partner, the age limit should be defined and the psychological assessment of the couple's relationship and their readiness for the IVF procedure was necessary (Blaževičienė, Jakušvaitė & Vaškelytė, 2014). In contrast, infertile couples were statistically more likely than fertile respondents to maintain that the IVF procedure should be fully reimbursed by the State. Fertile respondents were statistically more likely to be categorical with

respect to the number of embryos and the freezing of embryos. There was also a statistically significant difference in opinions of infertile respondents who were in favour of stricter regulation on the donation of reproductive cells (Blaževičienė et al., 2014).

4.5.2 Assisted Reproductive Technology and Public Perception: Gender Differences

Daniluk and Koert (2012) indicated that both Canadian men and women if confronted with infertility in the future were open to using IVF. Men were significantly more willing to consider using donated eggs and embryos, gestational surrogacy and fertility preservation. Women were significantly more willing to consider using IVF, ICSI and donor sperm. Overall, the childless respondents were not positively inclined to third party options. Similar results were reported about Swedish participants, indicating that men seemed to have more favourable perceptions of egg donation than women (Isikoglu et al., 2006). In contrast, Skoog-Svanberg, Lampic, Bergh and Lundkvist (2003) in a research in Sweden found that women were more positive than men towards egg donation.

A survey has been carried out in the UK by Kazem, Thompson, Hamilton and Templeton (1995) to find out the attitudes of both fertile and infertile men and women, as well as egg donors and recipients towards egg donation for treatment, diagnosis and research. They found that both sexes, irrespective of whether they were fertile or not, were more open to egg than sperm donation. Fertile participants were significantly less aware of egg donation. Education had little influence on attitudes, although more educated people were unlikely to use gamete donation for treatment

themselves. As mentioned above, people seemed to generally favour egg donation as a way of treating infertility.

4.5.3 Assisted Reproductive Technology and Public Perception in Iran

To the best of the author's knowledge to date there are very few studies in Iran on public perception of ART. Ahmady and Bamdad (2017) examined 505 Iranian public perceptions of assisted reproduction and its influence on adoption in Shiraz, the most populated city in the south of Iran. The results indicated that respondents did not support all types of assisted reproduction. Amongst modern infertility treatment methods, IVF (using husband's sperm and wife's egg) was the most widely acceptable. Gestational surrogacy and the use of donated gametes were less accepted.

Fereydouni, Fereydouni and Solimani (2009) investigated the attitude of males and females towards egg donation and factors affecting these variables such as gender and education. The result showed that in conditions with female infertility, female subjects were more open to accepting the procedure than men, and men were reported to be more against any kind of treatment under any circumstances. Kian, Riazi and Bashirian (2014) conducted a study to assess the attitudes of Iranian infertile couples toward surrogacy, with a sample of 150 infertile couples selected using a systematic randomized method. The researchers concluded that although there was not a significant difference between the overall positive attitudes of infertile women and men toward surrogacy, the general attitude toward using this method is not strongly positive.

4.6 Summary of the Chapter

This chapter reviewed psychological, social and medical aspects of children born by assisted reproduction and the extent to which public have perceptions regarding ART. Whilst there had been considerable research on the psychological consequences of being infertile and undergoing infertility treatment, little has been done on public perception as well as those involved in ART on psychological, medical and social consequences of children born by ART and in particular by egg donation. This chapter reviewed such studies and concluded that there are mixed views a) on the medical, psychological and social consequences of ART, and also mixed views on b) what the public think about ART. Thus, the next chapter is aimed at examining perceptions of the Iranian and British public, as well as women with a child conceived by ART, towards consequences of assisted reproductive technology.

Chapter 5

Study 1: Conception by Egg Donation: Iranian and British Perceptions

5.1 Preface

Whilst there has been numerous research on public perception and attitude towards egg donation, which is one of the features of ART (see e.g., Adashi et al., 2000; Culley, Hudson, Rapport, Johnson & Bharadwaj, 2006; Daniluk & Koert, 2012; Fauser et al., 2019; Purewal & van den Akker, 2009; Sabarre, Khan, Whitten, Remes & Phillips, 2013), there is little or no research to date to address the public perceptions of physical, social and psychological consequences of children born via egg donation, especially from a cross-cultural perspective. Furthermore, none has been reported on mothers who have given birth to a child by egg donation on their perceptions of physical, social and psychological consequences. This is the aim of the study reported in this chapter. As explained earlier, the main focus of this thesis is not to dispute or accept the research findings on physical, social and psychological consequences of children born by egg donation, but to assess the viewpoint of the general public and women with a donor egg child (Iran compared with Britain) about the key issues and controversies in research findings around children born as a result of egg donation (study 1).

5.2 Introduction

As mentioned in chapter 2, the ART techniques allow a third party involvement in the reproduction process, challenging traditional family identity (Dickens, Vayena, Rowe & Griffin, 2002). Hence, this technology raises many ethical, social, psychological issues and risks (Blyth & Landau, 2004; Papaharitou, Nakopoulou, Moraitou, Hatzimouratidis & Hatzichristou, 2007).

The review of the literature in chapter 3 has generally acknowledged the influence of cultural factors on infertility and its treatment, which has underlined significant differences between the way in which different cultures, particularly Western and Eastern, respond to issues related to infertility and infertility treatment (see e.g., Golombok et al., 2002; Greil, Slauson-Blevins & McQuillan, 2010; Sudha, Reddy, Reddy & Reddy, 2011). Präg and Mills (2017) for example, indicated that assisted reproductive technology was more broadly used in countries where it was considered culturally and morally acceptable to do so.

It is therefore of important to investigate the impact of ART in a Muslim country such as Iran with an estimated population of around 82.91 million in 2019 (WPR, 2019). This is because on the one hand there is a high percentage of primary and secondary infertility in Iran, for example, the results of an Iranian population-based study indicated that statistics showed that 17.3% of the couples had experienced primary infertility during their married life (Kazemijaliseh et al., 2015). On the other hand, for Iranians, having children is a fundamental drive for many couples soon after marriage, and both religious and cultural norms and values reinforce such perceptions. Iranian culture generally considers children as “divine gifts”, and producing children is the

fundamental reason for marriage among many couples. Having children is generally regarded as strengthening the institution of the family and as a sign of commitment to Iranian cultural values (Abbasi-Shavazi, Inhorn, Razeghi-Nasrabad & Toloo, 2008).

In chapter 3 it was argued that the “Iranian ART revolution” (Abbasi-shavazi et al., 2008) has made significant advances, and since the Iranian Government has a policy of encouraging the bearing of these children, it is not surprising that the country currently supports about 75 IVF clinics (Tremayne, 2012), a similar number to Egypt and one of the highest in the Middle East, with centres to be found in most of Iran’s provinces (Inhorn, 2005). Indeed, Shia-dominated Iran became one of the two countries in the Muslim world (Lebanon followed the Iranian leader’s fatwa) to allow ART in all forms, apart from certain restrictions on sperm donation (Inhorn & Tremayne, 2012).

As mentioned in chapter 3, despite the fact that using donor gametes has been legitimized in Iran by religious authorities and passed in law, little is known about public perception of the consequences of these methods and children born by egg donation, particularly in a collectivist country such as Iran the public perception plays an important role in infertile couples’ decision making for their actions regarding infertility treatment.

5.3 Aims of Study 1

In general, past research (reviewed in chapters 3 and 4) indicated that overall Iranian attitude towards third party involvement in infertility treatment is negative. Research findings indicated that the Iranian public is reluctant to practice egg donation and

surrogacy. The results of researches indicated that people, in general, are still conservative towards the third party donation methods (see e.g., Abbasi-shavazi, Nasrabad, Ardekani & Akhondi, 2006; Ahmady & Bamdad, 2017; Kian, Riazi & Bashirian, 2014; Pir Jalian, 2017; Zandi, Vanaki, Shiva & Mohammadi, 2014). In contrast, in Western countries most researches concluded that the public have positive attitudes towards IVF and gamete donation (see e.g., Fauser et al., 2019). Consequently, based on previous researches, it may be hypothesised that Iranians have generally more negative views about third party involvement in infertility treatment compared to the British. Therefore, Iranians are more likely to consider a child born by egg donation to have more medical, psychological and social problems than naturally born, compared to the British.

To date, there is no research on public perception of key issues and controversies on children conceived through egg donation. Although, as explained before, there are many studies on attitude toward the use and application of egg or sperm donation, secrecy or disclosure of genetic origins to donor egg offspring, experiences, characteristics, and motivations of recipients and donors.

Hence, the aim of the present study was to assess the research findings on the key issues and controversies around children conceived through egg donation, from the viewpoint of the general public in the two contrasting cultures of Iran and Britain. Furthermore, to compare with the perceptions of mothers (Iranian and British) with a child conceived by donor eggs on the medical, psychological and social consequences.

The results of such an investigation would enable one to see reasons for the generally negative attitudes that particularly Iranian women have demonstrated towards donating their eggs (Pir Jalian, 2013). Furthermore, to examine the extent to which these new innovations have been accepted by two contrasting cultures, namely Iranians and British with their distinctive religious beliefs and cultural norms. Thus, this will be a further test for the DIT. One may thus expect to see more resistance to acceptance of new innovations by participants with deeply rooted traditions and religious beliefs. Indeed a recent study by Urrutia (2019) reported that in Guatemala the Mayans with more deeply rooted traditions and religious beliefs differ sharply from Ladinos who follow a more Western lifestyle and traditions. Mayans, according to Urrutia, have less trust in modern medicine and show more resistance in accepting any new medical innovations in infertility treatment (<https://www.psychreg.org/assisted-reproductive-technologies/>).

As explained above, the key issue is to assess public perception on research findings and controversies surrounding children conceived through egg donation. However, in the absence of any previously reported studies, the first step was to identify reported scientific studies on children born by ART and identify the extent to which the general public can follow or be willing to make a comment about the scientific findings. Thus, it was necessary to conduct a pilot study to fulfil this aim.

5.4. The Pilot Study for the Selection of Items for the Questionnaire

Based on the literature review, 17 statements (as detailed in length in this chapter) were presented to 40 participants (both Iranians and British) for the following reasons:

a) clarity of the statements and b) possible willingness to give a response. The aim of the study was to see the extent to which general public would have an understanding of or be prepared to give an opinion about scientific findings on consequences (psychological, medical and social/educational) of children born as a result of ART by egg donation. The value of this screening is that it will root out any items in a study questionnaire that are likely to affect any further statistical analysis i.e. all or a significant majority of participants commented that they either do not have any understanding of this topic or are unwilling to give an opinion. Thus, such an item will not to be used in a full-scale research. Participants were 20 Iranians and 20 British males and females from the general public (Iranians were visitors to the UK).

5.4.1 Materials for the Pilot Study

The 17 statements in total were mainly adopted from research findings that have commonly been agreed by scientists on consequences of ART born children. It appeared that almost all reported studies were in the format of negative consequences on the part of a child born by ART. Thus, whilst this may look like a series of items mainly negative about consequences of ART born children, it has the virtue of presenting “factual” scientific findings rather than a series of specially worded negative and positive statements.

5.4.2 Procedure of the Pilot Study

Ethics approval for study 1 (also including the pilot study) was granted from Middlesex University Ethics Committee (see Appendix C). The reasons for conducting the study were explained to the participants by the researcher and it was also stated that participation was entirely voluntary and that participants were free to

withdraw from the study at any time. Furthermore, it was stated that the information provided would be treated in the strictest confidence. The questionnaire/statements sheet was administered to people on a one to one basis following their consent to take part in the study. Participants were particularly requested to read carefully and respond to each statement.

5.4.3 Results of the Pilot Study

The results of the pilot study indicated that almost all participants made no meaningful responses to 5 out of 17 statements. Almost all participants maintained that they were either not clear about what was meant by these statements or had no specific opinion. The following 5 statements were therefore removed from the study for the reasons explained above, as they were not expected to make any significant contribution to the statistical analysis.

5.4.4 Removed Statements from the Questionnaire/Statements

Statement 1: Donor egg conceived children are taller than naturally conceived children

Almost all participants maintained that they were either not clear about what is meant by these statements or had no specific opinion.

Statement 2: Donor egg conceived children have more chromosomal abnormalities than naturally conceived children

Almost all participants maintained that they were either not clear about what is meant by these statements or had no specific opinion.

Statement 3: Donor egg conceived children have shorter life expectancies than naturally conceived children

Almost all participants maintained that they were either not clear about what is meant by these statements or had no specific opinion.

Statement 4: Donor egg conceived children have lower scores on receptive language skills than naturally conceived children

Almost all participants maintained that they were either not clear about what is meant by these statements or had no specific opinion.

Statement 5: Donor egg conceived children are sometimes considered to be immoral or unnatural

Almost all participants maintained that they were either not clear about what is meant by these statements or had no specific opinion.

Thus, from the 17 statements, the remaining 12 were administered to 121 participants and were subjected to statistical and content analysis. Each statement was treated as a major contributor to public perception and thus analysed separately. The remaining 12 statements are as follows:

5.4.5 Remaining Statements in the Questionnaire

Statement 1: Donor egg conceived children have more childhood illnesses and medical care compared to naturally conceived children

Lu, Wang and Jin (2013) in a review of long-term follow-up of children conceived through assisted reproductive technology concluded that ART conceived children are

more likely to have childhood illnesses suggesting a significantly higher risk of requiring medical care, being admitted to hospital and surgery (see also Ludwig et al., 2009).

Statement 2: Donor egg children inherit most of their genes from their father

Crowley et al. (2015) reported “although we inherit equal amounts of genetic mutations from our parents, we actually “use” more of the DNA that we inherit from our fathers”. The report is about a study led by Professor Fernando Pardo-Manuel de Villena, from University of North Carolina School of Medicine, who said “mammals are more genetically similar to their fathers than mothers”.

Statement 3: Donor egg conceived children are more likely to be infertile themselves than naturally conceived children

A research conducted in 2015 cited that “mothers who use donor eggs may actually pass some of their genetic material on to their children through their endometrium fluid”. This makeover could be a disease or infertility issues to a resulting child (<https://lehmannhaupt.com/2016/01/06/becoming-a-solo-mom-via-assisted-reproductive-technology-donor-eggs/>; see also van Steirteghem, 2010).

Statement 4: Donor egg conceived children with a lack of genetic link (egg or sperm donation) results in psychological adjustment problems

It has been argued that the child may not be entirely accepted as part of the family, and that the absence of a genetic tie to one or both parents may have a damaging effect on the child’s sense of identity (Burns, 1987).

Statement 5: Donor egg conceived children are generally unhappier compared to naturally conceived children

Wagenaar et al. (2009) on behaviour and socio-emotional functioning in 9-18-year-old IVF children from parental and teacher observations reported that more IVF children scored in the borderline/clinical range on the syndrome scale withdrawn/depressed behaviour compared with their spontaneously conceived counterparts.

Statement 6: Donor egg conceived children are at higher risk of autism than naturally conceived children

Gao, He, Cai, Wang and Fan (2017) in a meta-analysis of the total 11 records (3 cohort studies and 8 case-control studies) revealed that the use of ART is associated with a higher percentage of autism spectrum disorder.

Statement 7: Donor egg conceived children have lower self-esteem than naturally conceived children

Zhan et al. (2013) in an overview of studies on psychological wellbeing in ART conceived children reported lower self-esteem in adolescents born following IVF than in the control group.

Statement 8: Donor egg conceived children should be told about the precise nature of their conception

HFEA (2004) removed the right of gamete donors to anonymity and gave donor conceived offspring a legal right to identify and possibly contact their donors on reaching the age of 18. The legislation was introduced because it was believed that

donor conceived offspring have a right to information about themselves, including their genetic identity, and denying them this information is harmful.

Statement 9: Donor egg conceived children have lower IQ scores than naturally conceived children

Zhan et al. (2013) in an overview of studies on psychological well-being in ART conceived children reported lower IQ scores following IVF children than in the control group.

Statement 10: Donor egg conceived children are at a greater risk of being expelled from school than naturally conceived children

Zhan et al. (2013) in an overview of studies on psychological well-being in ART conceived children reported that a higher prevalence of behaviour problems existed in ART children than in the control group. Also, the researchers reported higher incidences of physical aggression and higher rates of being suspended or expelled from school in IVF adolescents than in the matched control group, which did not occur when they were teenagers.

Statement 11: Donor egg conceived children might experience overt prejudice from the wider community, relatives and friends

Fasouliotis and Schenker (1999) stated that negative attitudes might exist towards reproductive technologies, with procedures such as IVF and DI sometimes considered as immoral or unnatural. As a result, families with a child conceived by assisted reproduction may experience overt prejudice not only from the wider community but also from relatives and friends (see also McNair, 2004).

Statement 12: Teachers should be informed of which children in their class have been born by egg donation

This statement is important, as it has been reported that the quality of parenting and the psychological adjustment of egg donation children and their parents may differ with Donor Insemination (DI) and IVF conception. For example, in egg donation families, mothers seemed to respond less sensitively to their child's needs, compared with mothers in DI and IVF families (Murray, MacCallum & Golombok, 2006). Although, on the school adjustment, no differences were found between children conceived by any of the three methods of conception. However, no research has been directed at how school adjustment is affected in Iranian egg donor families. This thus raises the question that if indeed, school adjustment is affected by egg donor families in Iran, teachers should know the origins of the problem and engage in appropriate intervention. Thus, this statement was selected as an option to put forward to the public and to the mothers with egg donation conceived children for their comments.

5.5 Study 1 Research Hypotheses

Null hypothesis 1- there will be no significant difference between Iranian and British participants on their perceptions of psychological, medical and social consequences of children born by egg donation as measured by responses to the 12-item Likert scale questionnaire/statements.

Alternative hypothesis 1- there will be a significant difference between Iranian and British participants on their perceptions of psychological, medical and social

consequences of children born by egg donation as measured by responses to the 12-item Likert scale questionnaire/statements.

Null hypothesis 2- there will be no significant gender difference between Iranian and British participants on their perceptions of psychological, medical and social consequences of children born by egg donation.

Alternative hypothesis 2- there will be a significant gender difference between Iranian and British participants on their perceptions of psychological, medical and social consequences of children born by egg donation.

Furthermore, a comparison will be made with Iranian and British mothers (4 Iranian and 4 British) with children born by egg donation, purely on descriptive statistics (because of the anticipated small numbers) on all 12 items.

5.6 Methodology

5.6.1 Research Design

A quantitative quasi-experimental, questionnaire-based research conducted with independent variables of age, gender, having children and nationality (Iranian vs. British), and dependent variable of responses to the 12 statements selected from research published e.g., “Donor egg conceived children have lower IQ scores than naturally conceived children” (Zhan et al., 2013) on a Likert scale (ranging from 1 to 4, Strongly agree, Agree, Disagree to Strongly disagree). Furthermore, the

participants were required to add any comments if they wished in support of their choice.

5.6.2 Participants

The sample included a total of 121 participants, 63 Iranian (Male = 26, Female = 37, Mean Age = 42.91, SD = 13.58) and 58 British (Male = 19, Female = 39, Mean Age = 32.36, SD = 14.02) in which 8 participants (4 Iranian and 4 British, Mean Age = 39.37, SD = 15.34) were mothers with donor egg children who were of primary school age, so as to identify possible differences in their perceptions of their egg donated conceived children in terms of psychological, medical and social issues due to nationality influences. Participants were recruited from the general population for comparison purposes.

5.6.3 Measurements

5.6.3.1 Socio-demographic Information

This part required participants to indicate their age, nationality, gender, and whether or not they have children. There were also items requesting participants to answer whether they have direct experience of egg donation and whether they know a friend or relative who had undergone egg donation treatment. It was soon noted that many of the participants were not willing to, or had no knowledge of, the latter requested items. Thus, the few answers given were not subjected to formal analysis in this thesis.

5.6.3.2 Perceptions of Children Born through Egg Donation

This part began with a brief explanation of the egg donation techniques so that it is made clearer what the statements relate to. It was then followed by the 12 statements, which measured perceptions on children born through egg donation. A 4-point Likert-type scale was provided, ranging from 1 to 4, Strongly agree, Agree, and Disagree to Strongly disagree with each statement mainly adopted from research findings on ART born children reported in the literature. The items addressed issues relating to the children born by ART which egg donation is one of the features. For example, “Donor egg conceived children are at higher risk of autism than naturally conceived children” (Knoester, Helmerhorst, van der Westerlaken, Walther & Veen, 2007). A statement was also included in the study (although not subjected to any formal research) as to “whether teachers should be informed of which child in their class has been born by egg donation”, this was in view of the significance of educational factors affecting a child born by egg donation (see Pir Jalian, 2017).

Each statement had an additional space provided for any comments that respondents may wish to add about the reasons of their choice on the Likert-type scale. Because the same rating scale ranging from Strongly agree, Agree, Disagree to Strongly disagree was used throughout the questionnaire, the higher score on the Likert scale indicated the more disagreement with the statements. Furthermore, in view of the research findings (and the statements in the questionnaire) that were more related to the negative consequences of children born by egg donation (e.g., have lower IQ than naturally born), this meant that a higher rating meant more favourable perceptions towards children born by egg donation. For example, if a participant states, “strongly disagree” with the statement that “donor egg conceived children have lower IQ scores than naturally born”, this means that this participant has positive views about a child

born by egg donation. One issue to note is that almost all the statements appear to give a negative message about the consequences of being conceived by egg donation. This is because the intention was to present “factual” scientific findings rather than providing a balance of positive and negatively worded statements (disregarding what the majority of scientific research has concluded) about the consequences of children born by egg donation.

5.6.4 Ethics Approval

Ethical Approval to conduct the study was obtained from Middlesex University, London and Iran University of Medical Science, Tehran (see Appendices C and D). Sampling was conducted from mainly the universities’ reception and meeting points. Completion of the questionnaire/statements was voluntary and participants were assured of anonymity and confidentiality. A consent form and an information sheet explaining the scope of the study were attached to the questionnaire. The participants was approached individually for the participation and the process lasted no longer than 20 minutes (see Appendix B).

5.6.5 Data Collection Procedure

The ethical considerations central to this study were related to privacy and voluntary participation. To comply with privacy requirements, the invitation to participate in the study was explained to the potential participants by the researcher. The researcher explained in detail the purpose of the study and also stated that participation was entirely voluntary and that participants were free to withdraw from the study at any time. Furthermore, it stated that the information provided would be treated in the strictest confidence, that only pooled data would be published and that no identifying

information would ever be released. The questionnaire/statements sheet was administered to people on a one to one basis following their consent to take part in the study. The process of data collection took five months to complete from January to May 2015.

Participants' names appeared only on the consent form. Because of the possibility that some of the issues raised could be emotionally disturbing they were also informed that counsellors from Middlesex University, London and the Iran University of Medical Sciences were available if needed and could be contacted at any time on the telephone numbers supplied (see Appendix B).

5.7 Results of Study 1

It is important to note that the religion was not specifically analysed because all Iranians were Muslim and the British mainly selected “other” or had no responses. In addition, with respect to the age, it was found that there are significant differences between Iranian and British participants, thus, this variable was used as covariate in all the analysis.

5.7.1 Principle Component Analysis (PCA)

Principle Components Analysis was conducted on the collected data and one factor solution was identified with Eigenvalue greater than one. The factor with Eigenvalue = 5.36, accounted for 44.69 % of the variance and consisted of 9 statements (items) (see Appendix A for full analysis of the results). One solution was to analyse the data with regards to this single factor, which to give an appropriate label proved to be difficult. Cronbach's alpha was conducted showing 7 items with strong correlations (over 0.3) with the factor ($\alpha = 0.88$). The mean score for the factor for the remaining statements (items) was obtained and subjected to Factorial Analysis of Variance. However, following the statistical analysis that is reported below it was decided to analyse each statement separately to provide a clear and more comprehensive account of the present results.

Table 5. 0 Descriptive table for Factorial ANOVA for the PCA (single factor)

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	2.82 (SD = 0.57)	2.81 (SD = 0.68)
Female	2.93 (SD = 0.42)	3.26 (SD = 0.54)

As can be seen in the table 5.0 it seems that there is a difference between males and females with females scoring higher than males, which means overall women more than men, were in disagreement with the statements (the higher the scores the more in disagreement with the statements).

A 2 Gender by 2 Participants (Iranians and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to items belonging to the Factor. There was a significant main effect for Gender with $F(1, 122) = 8.06$, $MSe = 0.301$, $P = 0.005$, $\eta_p^2 = 0.06$, however, there was no significant main effect for Participants with $F(1, 122) = 2.94$, $MSe = 0.301$, $P = 0.08$, $\eta_p^2 = 0.02$ and for Interaction effect with $F(1, 122) = 3.19$, $MSe = 0.301$, $P = 0.07$, $\eta_p^2 = 0.02$.

5.7.2 The Results of Quantitative Analysis (Study 1)

The responses from the eight mothers with donor egg children (4 Iranian and 4 British) were subjected to descriptive analysis. The results showed that Iranian mothers with donor egg children more than their British counterparts agreed that conception via egg donation may have psychological, social and medical problems for the resulting children due to lack of a genetic link. Furthermore, considering the child to be unhappier than naturally born, and that they may experience overt prejudice from the wider community, relatives and friends. In particular, on the item of disclosure to the teacher they agreed more than the British that teachers should have knowledge of which child is born by egg donation in their classroom (see also Pir Jalian, 2017).

The responses of 113 participants (Iranian and British men and women) were subjected to Factorial Analysis of Variance taking into account nationality (Iranian vs. British) and gender as independent variables. Furthermore, additional responses given to the statements were subjected to content analysis.

Overall analysis of the results of the Iranian and the British public showed that the men more than the women and the Iranians more than the British were in agreement with scientific research that children conceived via egg donation have more medical, psychological and social problems than naturally born.

What follows are the 12 statements based on investigations on scientific research findings presented to British and Iranian mothers with donor egg conceived children and the British and Iranian public. The collected data were subjected to descriptive and inferential statistical analysis. The responses to the statements were on Likert scale ranging from 1 to 4, Strongly agree, Agree, Disagree and Strongly disagree to each statement and implying that the higher the score the more disagreement with each statement, hence, more favourable towards donation.

Statement 1: Donor egg conceived children have more childhood illnesses than naturally conceived children

Responses of Iranian and British mothers with donor egg children to statement 1:

The mean score for both Iranian and British mothers with donor egg children were 3.5. As can be seen in graph 1 almost all participants disagreed or strongly disagreed with the statement of more childhood illnesses in donor egg children than naturally conceived. See figure below for the statement 1:

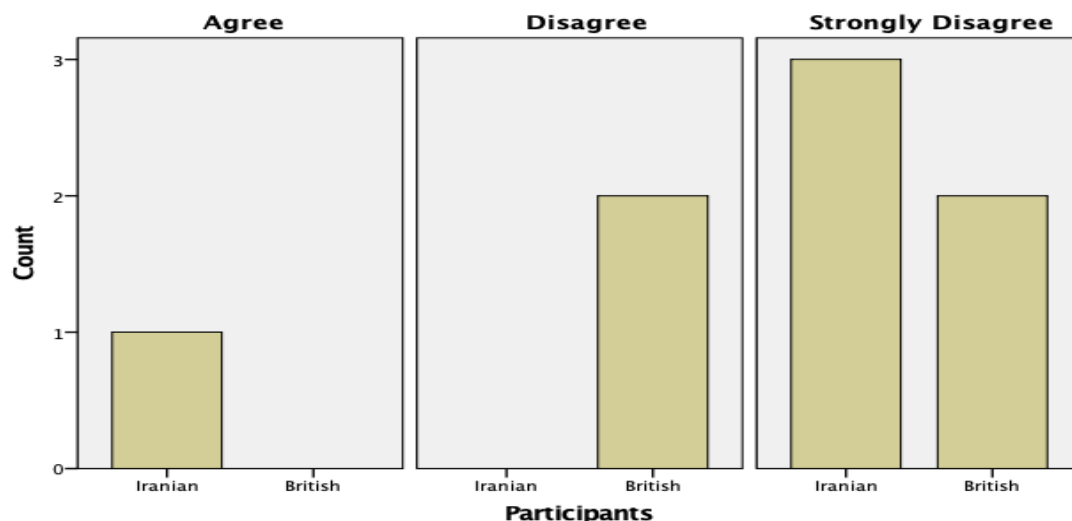


Figure 5. 1: A graphic display of the number of responses of Iranian and British mothers with donor egg children to the statement 1 “Donor egg conceived children have more childhood illnesses than naturally conceived children”. The higher the rating the more disagreement with the statement

Table 5. 1 Mean (SD) for responses of Iranian and British public to statement 1

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	2.33 (SD = 0.86)	2.58 (SD = 0.79)
Female	2.68 (SD = 0.78)	3.02 (SD = 0.69)

As can be seen in table 5. 1 it seems that overall women more than men and British more than Iranian participants were in disagreement with more childhood illnesses in donor egg children than naturally conceived.

A 2 Gender by 2 Participants (Iranian and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 1. There was a significant main effect for Gender $F(1, 104) = 6.74, MSE = 0.60, p = 0.01, \eta_p^2 = 0.06$ and for Participants $F(1, 104) = 4.29, MSE = 0.60, p = 0.04, \eta_p^2 = 0.04$. There was, however, no significant Interaction effect. See figure below for the responses of Iranian and British public to the statement 1:

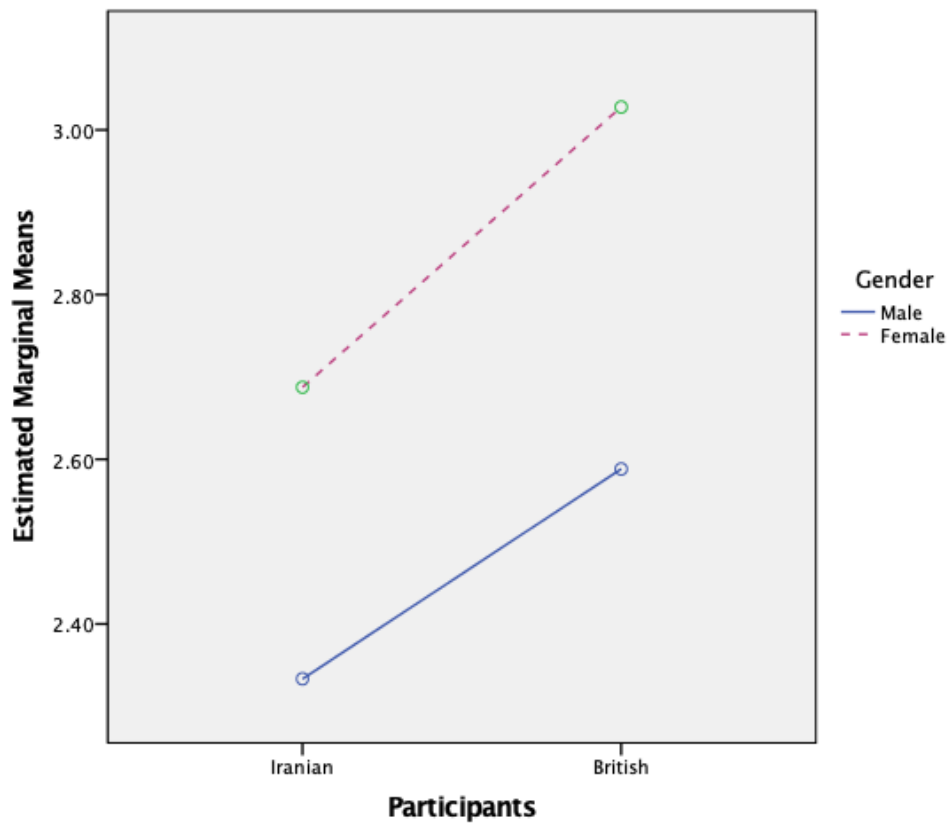


Figure 5. 2: A graphic display of the responses of Iranian and British public to the statement 1 “Donor egg conceived children have more childhood illnesses than naturally conceived children”

Statement 2: Donor egg children inherit most of their genes from their father

Responses of Iranian and British mothers with donor egg children to statement 2:

The mean scores of mothers with donor egg conceived children were 3.75 for Iranians and 3.5 for British. As can be seen in graph 2 the general tendency was toward disagree and strongly disagree part of the scale and indicated that both cultural groups were in disagreement with donor conceived children inherit most of their genes from their father. See figure below for the statement 2:

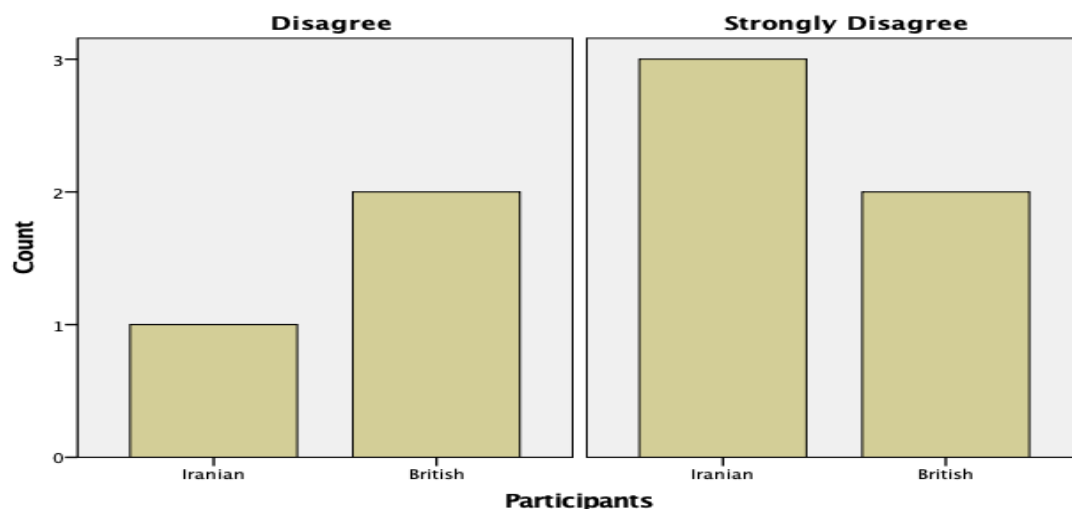


Figure 5. 3: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 2 “Donor egg conceived children inherit most of their genes from their father”. The higher the rating the more disagreement with the statement

Table 5. 2 Mean (SD) for responses of Iranian and British public to statement 2

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	2.40 (SD = 0.91)	2.76 (SD = 1.03)
Female	2.71 (SD = 0.72)	3.13 (SD = 0.79)

As can be seen in table 5. 2 it seems that overall women more than men and British more than Iranian participants were in disagreement with donor-conceived children inherit most of their genes from their father.

A 2 Gender by 2 Participants (Iranian and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 2. There was a significant main effect for Gender $F(1, 105) = 4.21, MSE = 0.72, p = 0.04, \eta_p^2 = 0.03$ and for Participants $F(1, 105) = 4.76, MSE = 0.72, p = 0.03, \eta_p^2 = 0.04$. There was, however, no significant Interaction effect. See figure below for the responses of Iranian and British public to the statement 2:

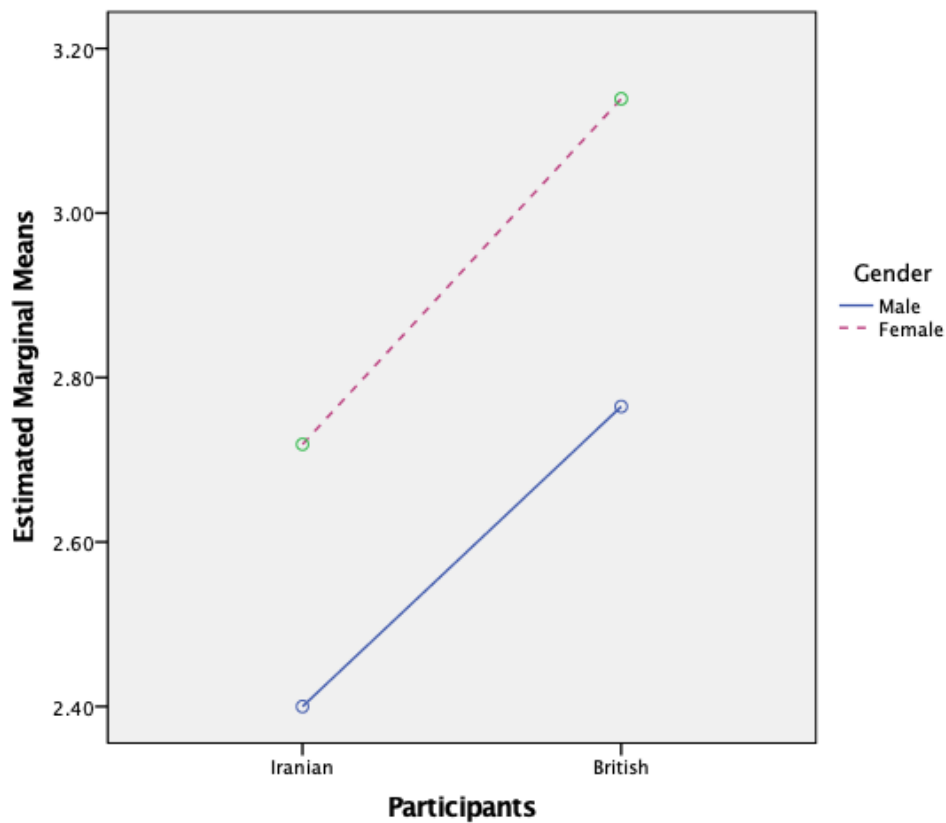


Figure 5. 4: A graphic display of the responses of Iranian and British public to the statement 2 “Donor egg conceived children inherit most of their genes from their father”

Statement 3: Donor egg conceived children are more likely to be infertile themselves than naturally conceived children

Responses of Iranian and British mothers with donor egg children to statement 3:

The mean scores of mothers with donor egg children were 3.5 for Iranians and 3.75 for British. As can be seen in graph 3 the general tendency was toward disagree and strongly disagree part of the scale and indicated that both Iranians and British were in disagreement with the statement of donor egg children being more likely to be infertile than naturally conceived. See figure below for the statement 3:

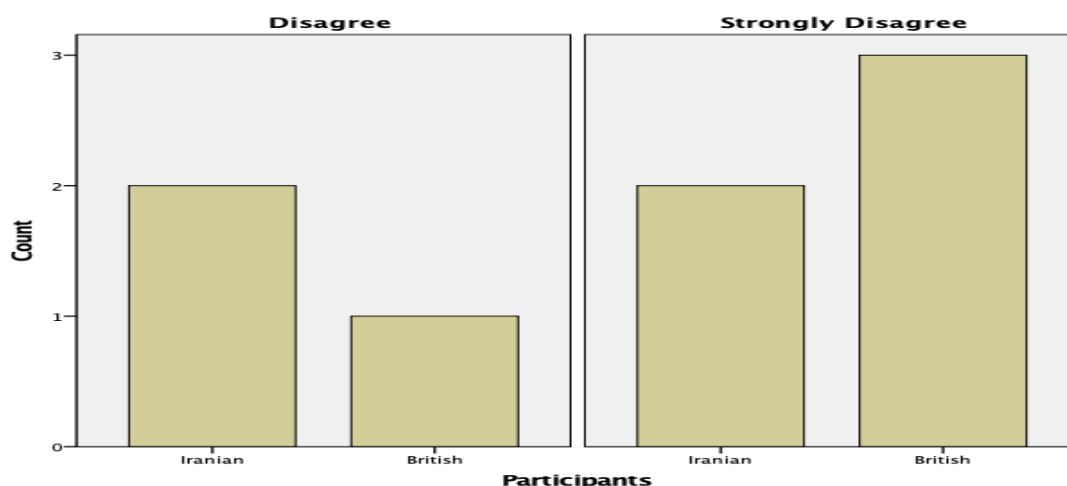


Figure 5. 5: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 3 “Donor egg conceived children are more likely to be infertile themselves than naturally conceived children”. The higher the rating the more disagreement with the statement

Table 5. 3 Mean (SD) for responses of Iranian and British public to statement 3

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	2.95 (SD = 0.84)	2.64 (SD = 0.93)
Female	2.84 (SD = 0.62)	3.22 (SD = 0.83)

As can be seen in table 5.3 it seems to be overall no difference between men and women and both Iranian and British participants. It means that both nationalities and genders were in disagreement with statement 3. However, a significant interaction effect as depicted in figure 3 showed that there was a difference between British males and females with the females being more strongly in disagreement with the statement of donor egg children being more likely to be infertile than naturally conceived in future.

A 2 Gender by 2 Participants (Iranian and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 3. There was no significant main effect for Gender and for Participants. There was, however, a significant Interaction effect with $F(1,102) = 4.8$, $MSE = 0.63$, $p = 0.03$ and $\eta_p^2 = 0.04$.

Analysis of simple effects using independent groups t-test showed no significant difference between Iranian males and females. However, there was a significant difference between British males and females with $t(51) = -2.26$, $p = 0.02$ indicating that the British males agreed more than the British females with the statement. See figure below for the responses of Iranian and British public to statement 3:

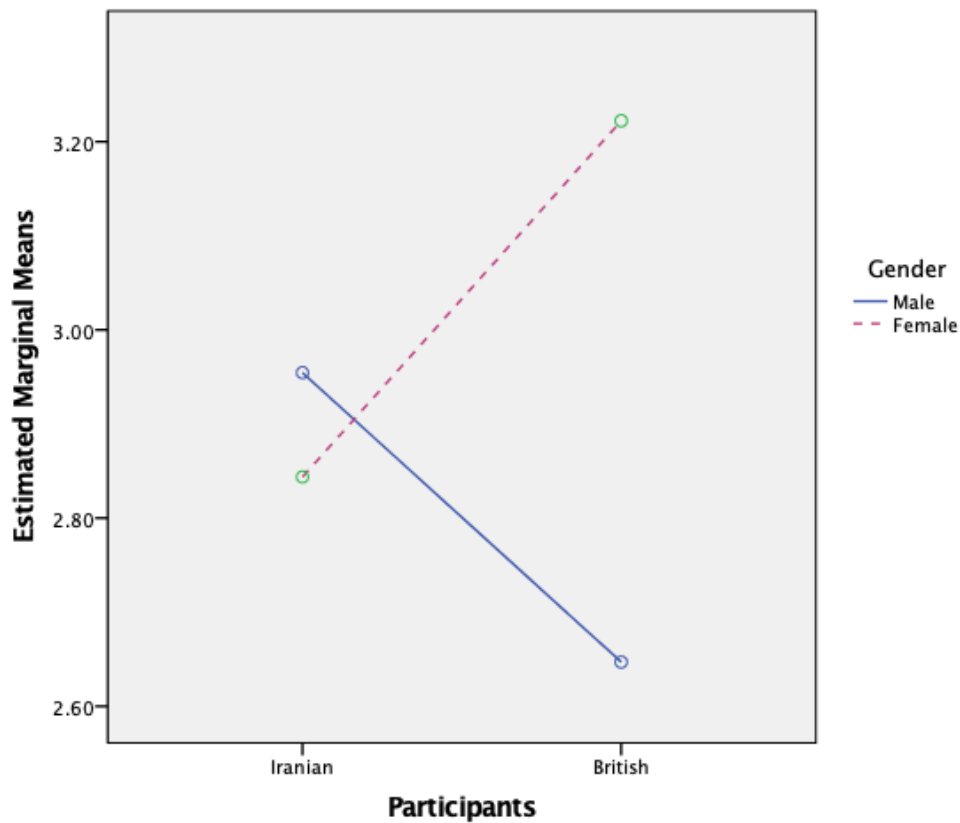


Figure 5. 6: A graphic display of the responses of Iranian and British public to statement 3 “Donor egg conceived children are more likely to be infertile themselves than naturally conceived children”

Statement 4: Donor egg conceived children with a lack of genetic link result in psychological adjustment problems

Responses of Iranian and British mothers with donor egg children to statement 4:

The mean score of Iranian and British mothers with donor egg children were 3.5 for British and 2.6 for Iranians, which indicated that British were more strongly than Iranians in disagreement with a lack of genetic link results in psychological problems on donor egg children. See figure below for the statement 4:

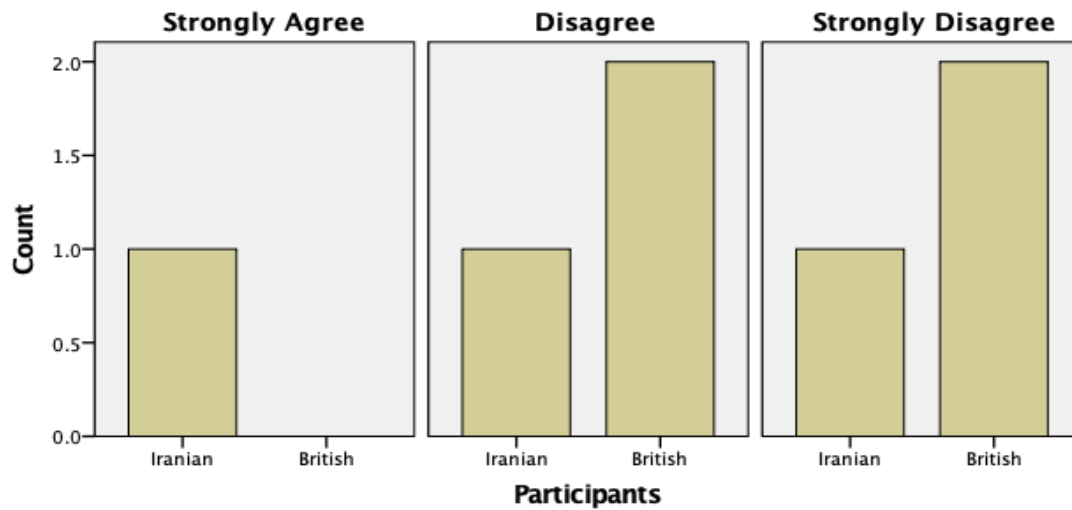


Figure 5. 7: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 4 “Donor egg conceived children with a lack of genetic link result in psychological adjustment problems”. The higher the rating the more disagreement with the statement

Table 5. 4 Mean (SD) for responses of Iranian and British public to statement 4

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	2.91 (SD = 0.79)	2.70 (SD = 0.77)
Female	2.78 (SD = 0.64)	3.05 (SD = 0.58)

As can be seen in table 5. 4 it seems that overall there was no significant difference between the two groups of Iranians and British and males and females on the statement of lack of genetic link results in psychological adjustment problems for donor egg children. It means that both nationalities and genders were in disagreement with the statement 4.

A 2 Gender by 2 Participants (Iranian and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 4. There was no significant main effect for Gender and for Participants. Also, there was no significant Interaction effect. See figure below for the responses of Iranian and British public to statement 4:

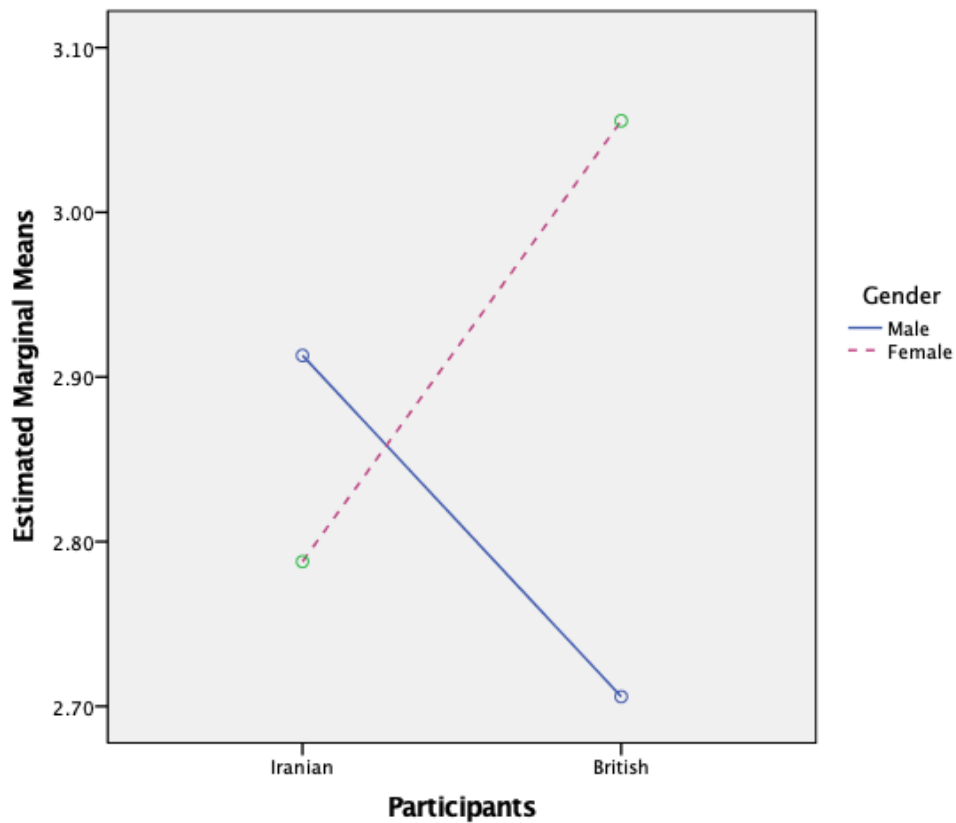


Figure 5. 8: A graphic display of the responses of Iranian and British public to statement 4 “Donor egg conceived children with a lack of genetic link result in psychological adjustment problems”

Statement 5: Donor egg conceived children are generally unhappier than naturally conceived children

Responses of Iranians and British mothers with donor egg children to statement 5:

The mean score of mothers with donor egg children were 2.5 for Iranians and 3.75 for British, which showed that British were more strongly than Iranians in disagreement with the statement of donor egg children being unhappier than naturally conceived.

See figure below for the statement 5:

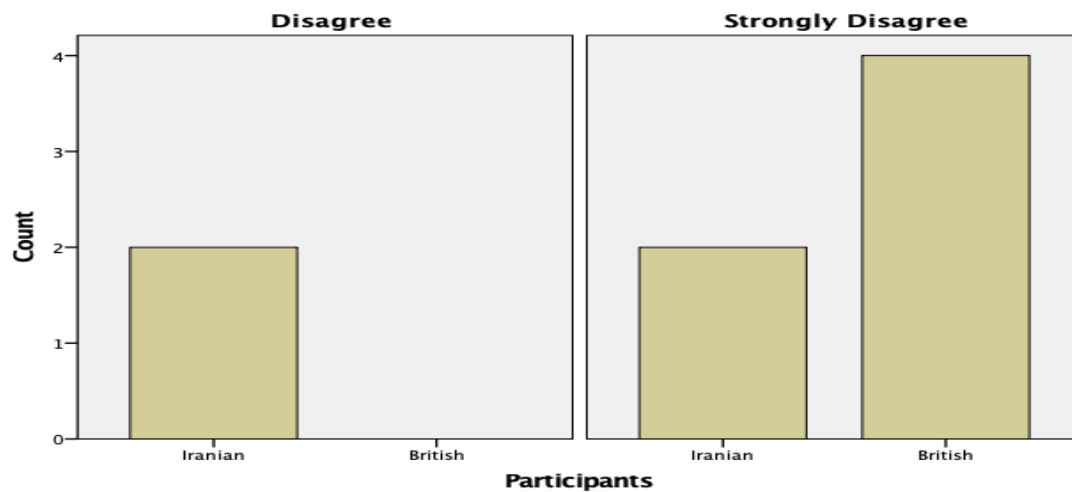


Figure 5. 9: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 5 “Donor egg conceived children are generally unhappier than naturally conceived children”. The higher the rating the more disagreement with the statement

Table 5. 5 Mean (SD) for responses of Iranian and British public to statement 5

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	3.00 (SD = 0.85)	2.58 (SD = 0.79)
Female	2.96 (SD = 0.47)	3.33 (SD = 0.71)

As can be seen in table 5. 5 it seems that overall females are more than males in disagreement with the statement but there was no difference between the Iranian and British participants. However, a significant interaction effect as depicted in figure 5 showed that there was a difference between British males and females with the females being more strongly in disagreement with donor egg children being unhappier than naturally conceived.

A 2 Gender by 2 Participants (Iranians and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 5. There was a significant main effect for Gender $F(1, 103) = 6.13, MSE = 0.49, p = 0.01, \eta_p^2 = 0.05$ but not for Participants. There was, however, a significant Interaction effect with $F(1,103) = 7.00, MSE = 0.49, p = 0.009$ and $\eta_p^2 = 0.06$.

Analysis of simple effects using independent groups t-test showed no significant difference between Iranian males and females, however, a significant difference between British males and females with $t(51) = -3.41, p = 0.001$ indicating that the British male agreed more than the British female with the statement. See figure below for the responses of Iranian and British public to the statement 5:

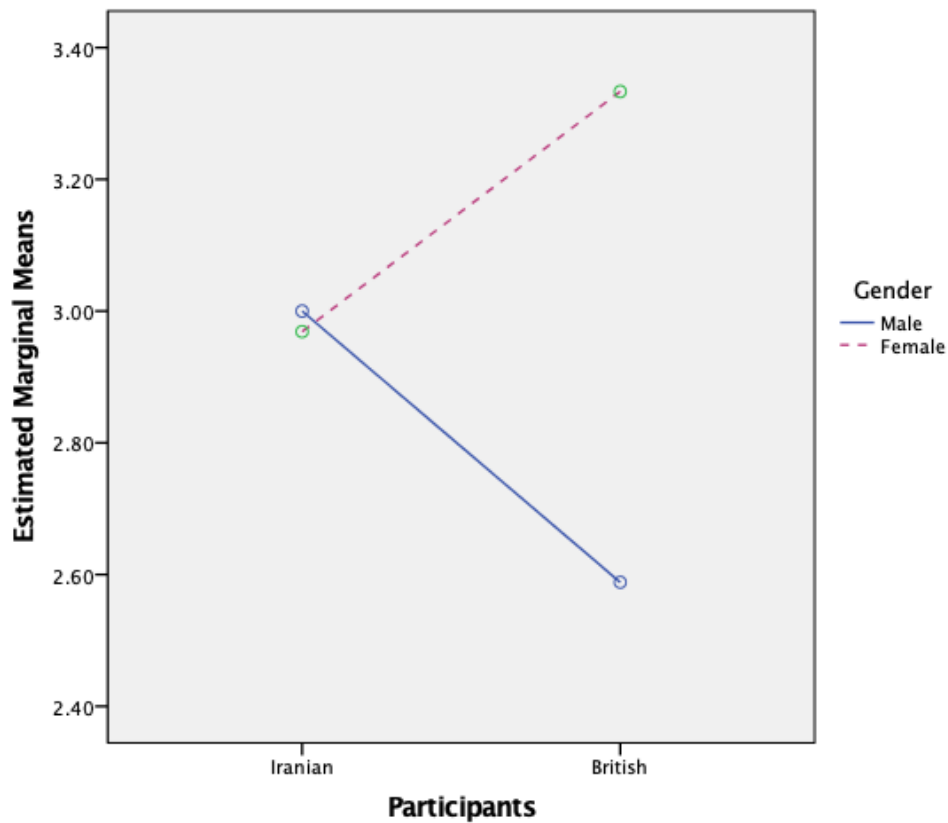


Figure 5. 10: A graphic display of the responses of Iranian and British public to statement 5 “Donor egg conceived children are generally unhappier than naturally conceived children”

Statement 6: Donor egg conceived children are at higher risk of Autism than naturally conceived children

Responses of Iranian and British mothers with donor egg children to statement 6:

The mean score of mothers with donor egg children were 3.75 for Iranians and 3.5 for British, which indicated that overall both cultural groups were in disagreement with the statement of donor egg conceived children are at higher risk of autism than naturally conceived. See figure below for the statement 6:

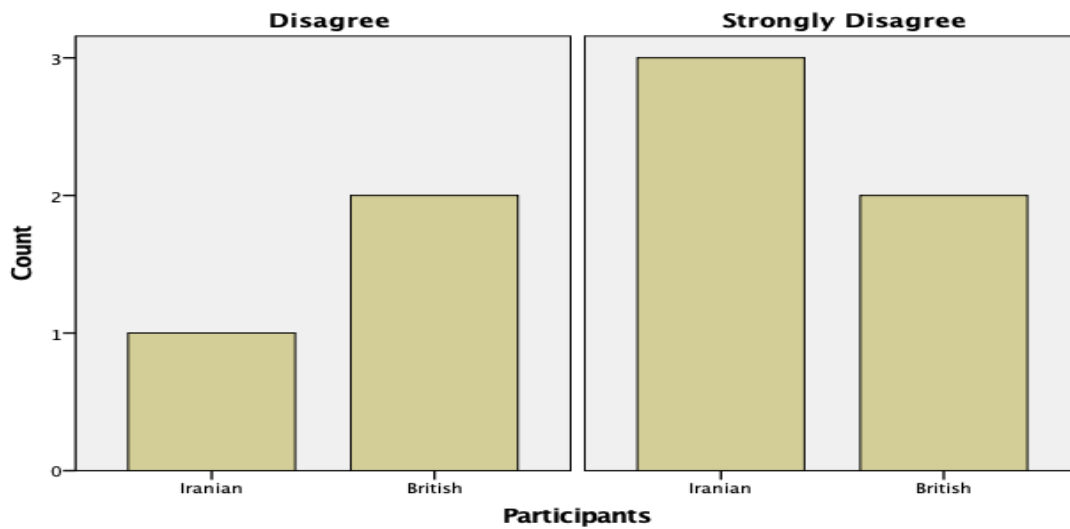


Figure 5. 11: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 6 “Donor egg conceived children are at higher risk of Autism than naturally conceived children”. The higher the rating the more disagreement with the statement

Table 5. 6 Mean (SD) for responses of Iranian and British public to statement 6

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	2.95 (SD = 0.89)	2.64 (SD = 0.86)
Female	2.86 (SD = 0.62)	3.34 (SD = 0.59)

As can be seen in table 5. 6 it seems that overall women were more than men in disagreement with the statement, however, there was no difference between the two Iranian and British cultural groups. There was also a significant interaction effect, as depicted in figure 6, that there was a difference between British men and women with women being more strongly in disagreement with the statement.

A 2 Gender by 2 Participants (Iranians and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 6. There was a significant main effect for Gender $F(1, 99) = 5.11, MSE = 0.51, p = 0.02, \eta_p^2 = 0.04$ but not for Participants. There was also a significant Interaction effect with $F(99) = 8.17, MSE = 0.51, p = 0.005$ and $\eta_p^2 = 0.07$.

Analysis of simple effects using independent groups t-test showed no significant difference between Iranian males and females, however, a significant difference between British males and females with $t(50) = -3.41, p = 0.001$ indicating that the British male agreed more than their female counterparts with the statement. See figure below for the responses of Iranian and British public to the statement 6:

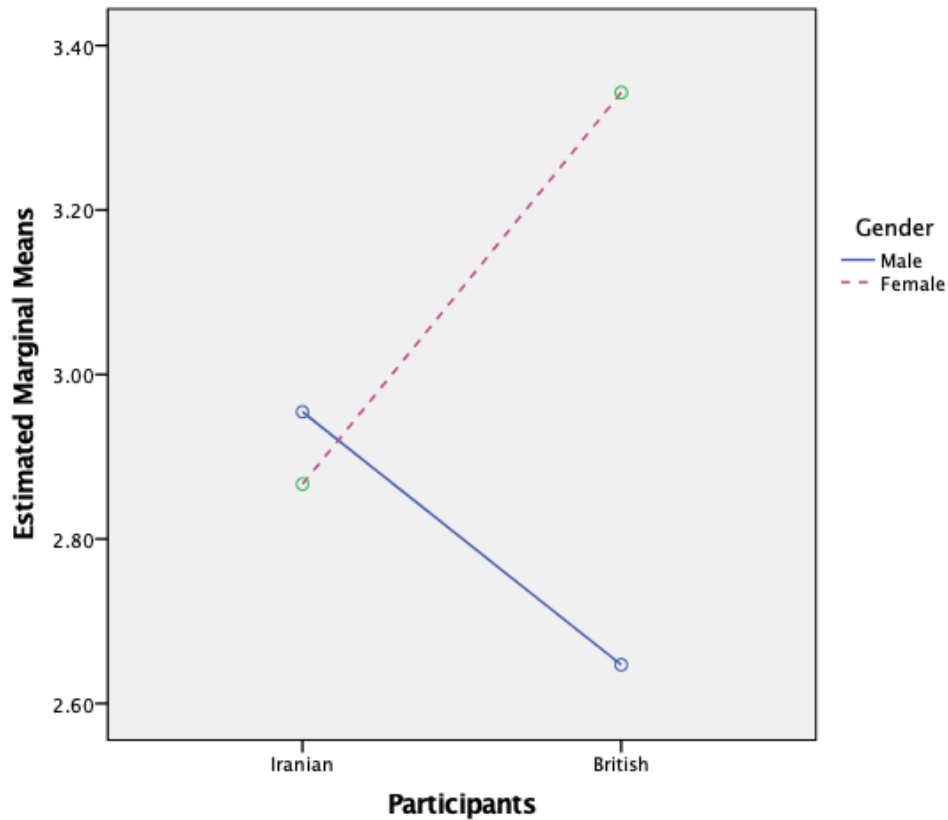


Figure 5. 12: A graphic display of the responses of Iranian and British public to statement 6 “Donor egg conceived children are at higher risk of Autism than naturally conceived children”

Statement 7: Donor egg conceived children have lower self-esteem than naturally conceived children

Responses of Iranian and British mothers with donor egg children to statement 7:

The mean score of mothers with donor egg children were 3.5 for Iranians and 3.75 for British, which indicated both Iranians and British were in disagreement with the statement of lower self-esteem in donor egg children than naturally conceived. See graph 7 for statement 7 below:

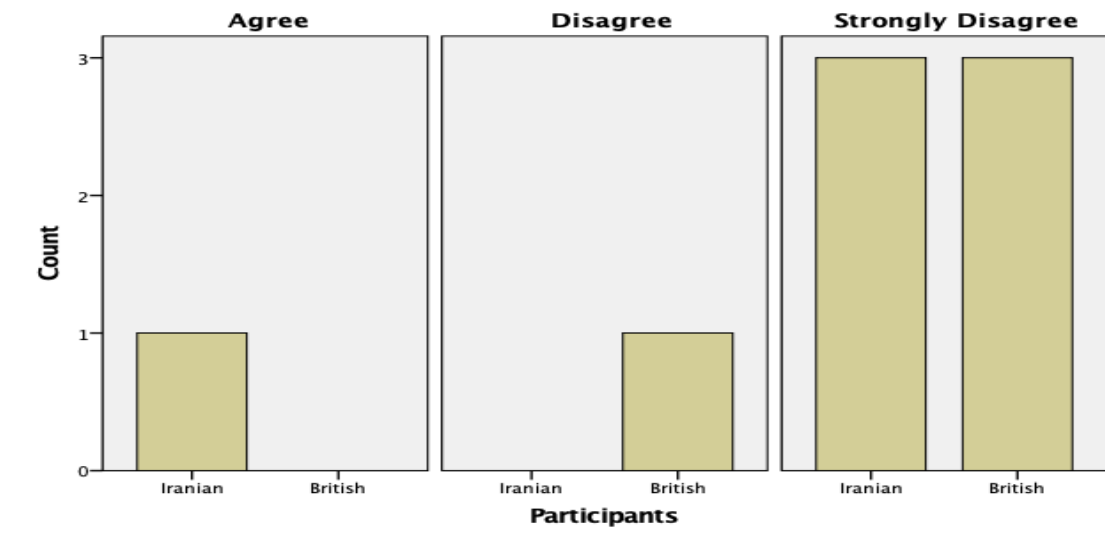


Figure 5. 13: A graphic display of the number of responses of Iranian and British mothers with donor egg children to the statement 7 “Donor egg conceived children have lower self-esteem than naturally conceived children”. The higher the rating the more disagreement with the statement

Table 5. 7 Mean (SD) for responses of Iranian and British public to statement 7

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	3.08 (SD = 0.77)	2.70 (SD = 0.61)
Female	3.06 (SD = 0.56)	3.25 (SD = 0.61)

As can be seen in table 5.7 it seems that overall females were more than males in disagreement with the statement but there was no difference between the both Iranian and British participants. However, a significant interaction effect as depicted in figure 7 showed that there was a difference between Iranian males and females with the males being slightly more in disagreement with the statement of donor egg conceived children have lower self-esteem than naturally conceived.

A 2 Gender by 2 Participants (Iranian and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 9. There was a significant main effect for Gender $F(1, 103) = 4.53$, $MSE = 0.42$, $p = 0.03$, $\eta_p^2 = 0.04$ but not for Participants. However, there was a significant Interaction effect with $F(1,103) = 5.93$, $MSE = 0.42$, $p = 0.01$ and $\eta_p^2 = 0.05$.

Analysis of simple effects using independent groups t-test showed a significant difference between Iranian males and females with $t(50) = -3.41$, $p = 0.001$, however, there was no significant difference between British males and females. See figure below for the responses of Iranian and British public to the statement 7:

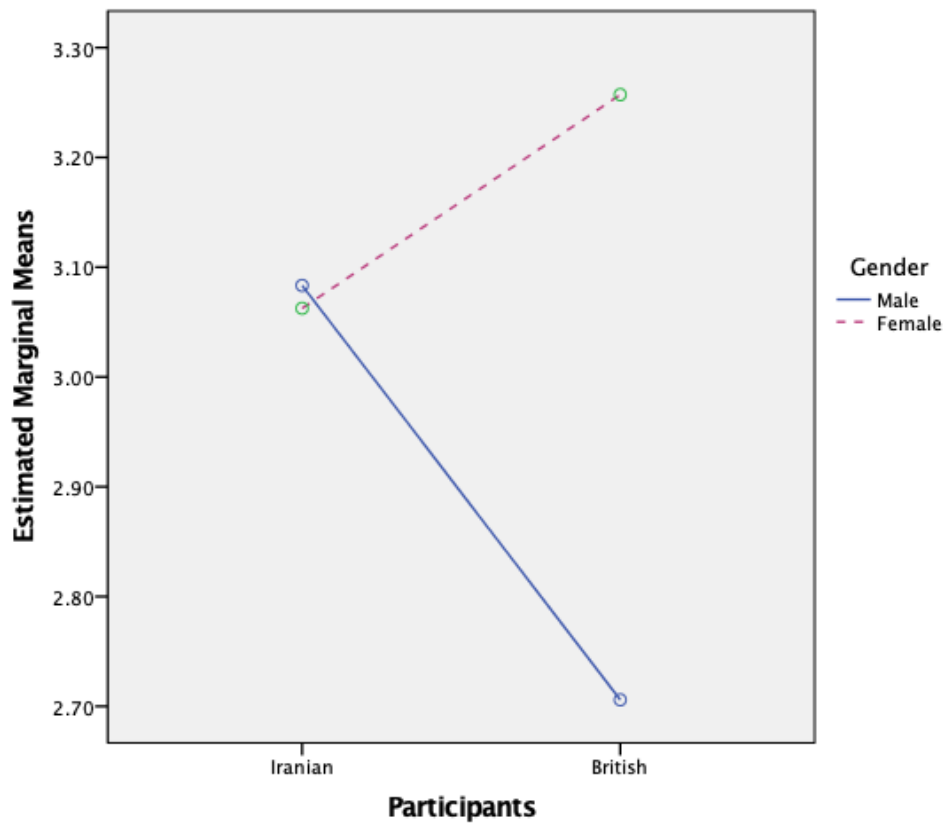


Figure 5. 14: A graphic display of the responses of Iranian and British public to statement 7 “Donor egg conceived children have lower self-esteem than naturally conceived children”

Statement 8: Donor egg conceived children should be told about the precise nature of their conception

Responses of Iranian and British mothers with donor egg children to statement 8:

The mean score of mothers with donor egg child for both Iranian and British groups were 2.5, which indicated that overall the two groups were in agreement that donor egg conceived children should be told about the precise nature of their conception.

See figure below for the statement 8:

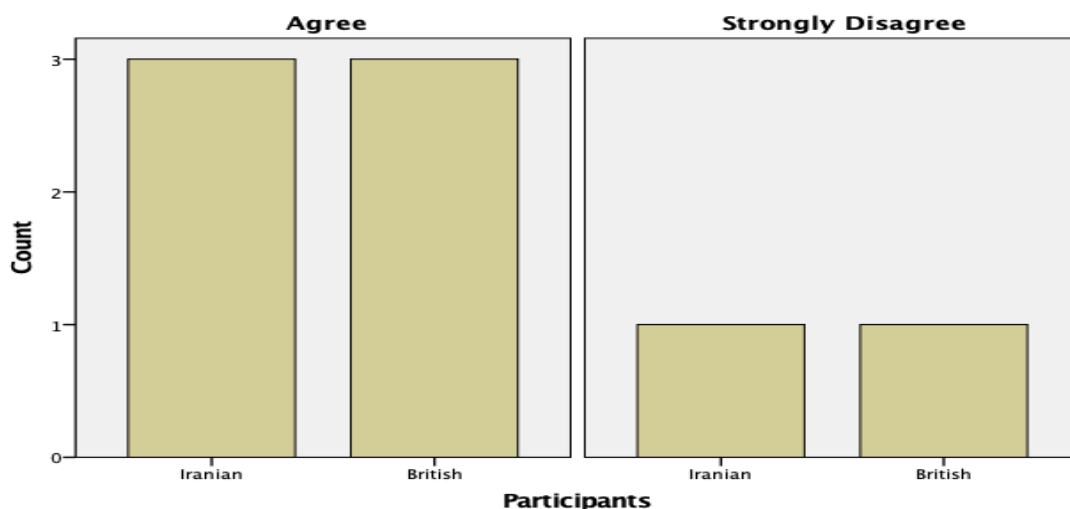


Figure 5. 15: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 8 “Donor egg conceived children should be told about the precise nature of their conception”. The higher the rating the more disagreement with the statement

Table 5. 8 Mean (SD) for responses of Iranian and British public to statement 8

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	2.37 (SD = 1.13)	2.35 (SD = 0.93)
Female	2.40 (SD = 0.87)	2.45 (SD = 0.88)

As can be seen in table 5. 8 it seems to be overall no difference between males and females and between the Iranians and British in their disagreement with the statement of donor egg conceived children should be told about the precise nature of their conception.

A 2 Gender by 2 Participants (Iranian and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 8. There was no significant main effect for Gender and for Participants. Also, there was no significant Interaction effect. See figure below for the responses of Iranian and British public to statement 8:

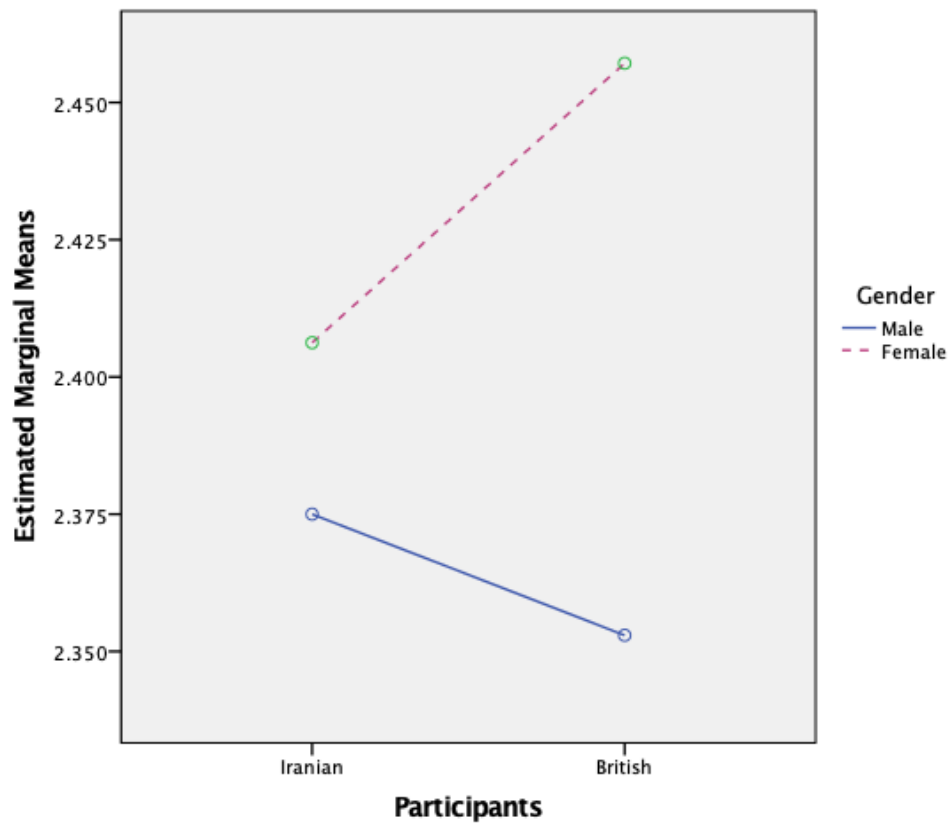


Figure 5. 16: A graphic display of the responses of Iranian and British public to statement 8 “Donor egg conceived children should be told about the precise nature of their conception”

Statement 9: Donor egg conceived children have lower IQ scores than naturally conceived children

Responses of Iranian and British mothers with donor egg children to statement 9:

The mean score of mothers with donor egg children were 4.0 for Iranians and 3.75 for British, which indicated that both Iranian and British were in disagreement with lower IQ scores in donor egg children than naturally conceived. See figure below for the statement 9:

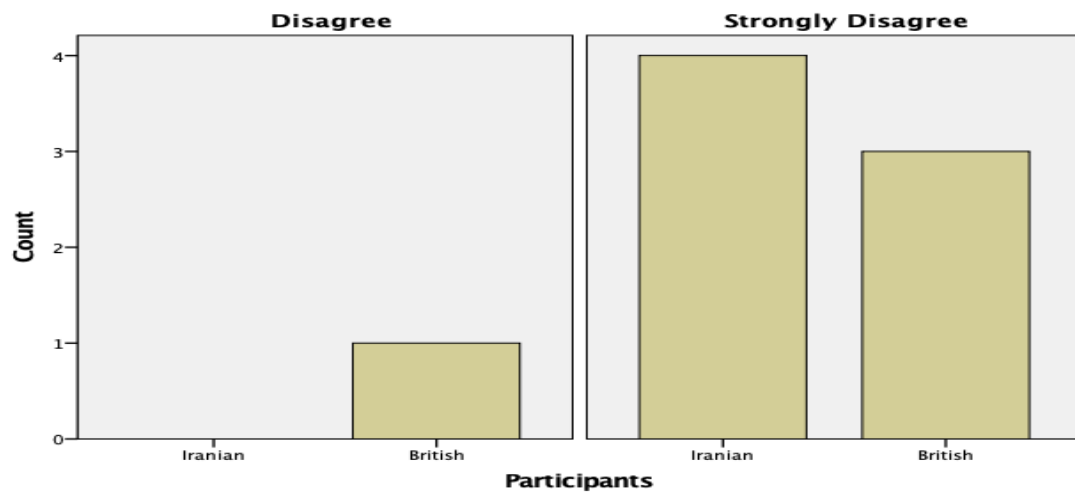


Figure 5. 17: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 9 “Donor egg conceived children have lower IQ scores than naturally conceived children”. The higher the rating the more disagreement with the statement

Table 5. 9 Mean (SD) for responses of Iranian and British public to statement 9

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	3.37 (SD = 0.64)	2.82 (SD = 0.52)
Female	3.12 (SD = 0.49)	3.33 (SD = 0.53)

As can be seen in table 5. 9 it seems that overall there was no difference between males and females and British and Iranian participants in their disagreement with the statement, however, there was a significant interaction effect as depicted in figure 9, that there was a difference between British males and females with the females being more in disagreement with lower IQ scores in donor egg children than naturally conceived.

A 2 Gender by 2 Participants (Iranian and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 9. There was no significant main effect for Gender and for Participants. There was, however, a significant Interaction effect with $F(1,103) = 11.40$, $MSE = 0.30$, $p = 0.001$ and $\eta_p^2 = 0.100$.

Analysis of simple effects using independent groups t-test showed no significant difference between Iranian males and females British males and females, however, there was a significant difference between British males and females with $t(51) = -3.25$, $p = 0.002$. The British males were more in agreement with the statement than British females, and in contrast Iranian men were more in disagreement with the statement than their female counterparts. See figure below for the responses of Iranian and British public to statement 9:

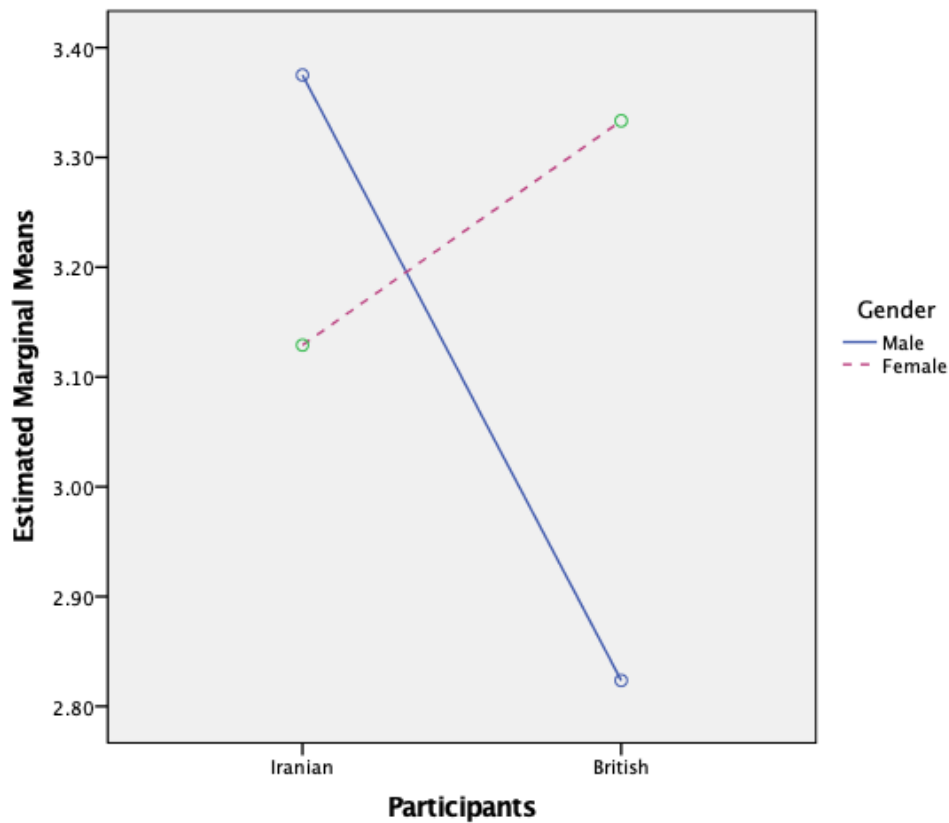


Figure 5. 18: A graphic display of the responses of Iranian and British public to statement 9 “Donor egg conceived children have lower IQ scores than naturally conceived children”

Statement 10: Donor egg conceived children are at greater risk of being expelled from school than naturally conceived children

Responses of Iranian and British mothers with donor egg children to statement 10:

The mean score of mothers with donor egg children were 4.0 for Iranians and 3.75 for British, which indicated that both Iranian and British groups were in disagreement with donor egg conceived children are at greater risk of being expelled from school than naturally conceived. See figure below for the statement 10:

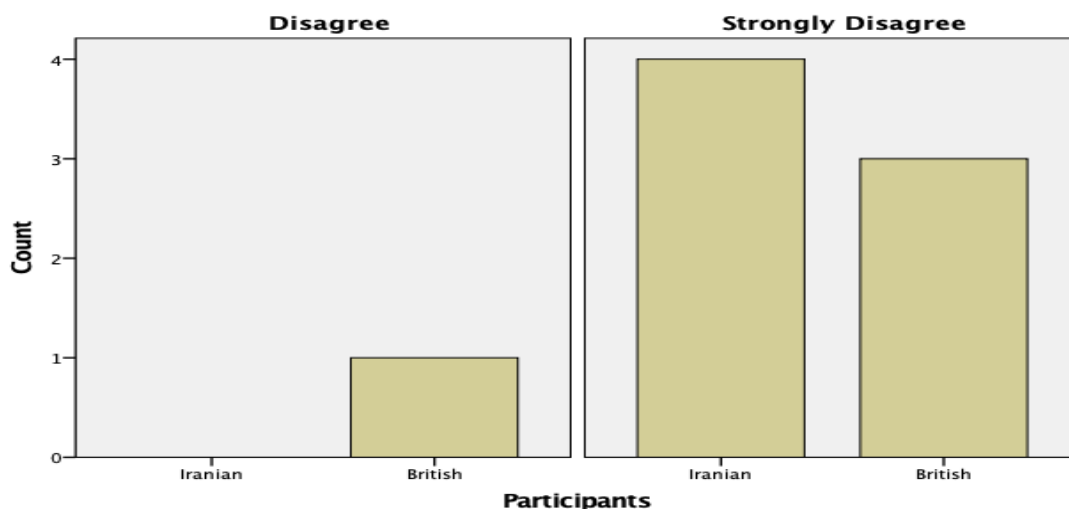


Figure 5. 19: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 10 “Donor egg conceived children are at greater risk of being expelled from school than naturally conceived children”. The higher the rating the more disagreement with the statement

Table 5. 10 Mean (SD) for responses of Iranian and British public to statement 10

Gender	Iranians/Mean SD)	British/Mean (SD)
Male	3.21 (SD = 0.67)	2.82 (SD = 0.72)
Female	3.09 (SD = 0.46)	3.41(SD = 0.64)

As can be seen in table 5. 10 it seems that overall there was no difference between males and females and between both British and Iranian groups in disagreement with the statement. However, a significant interaction effect as depicted in figure 10 showed that there was a difference between British males and females with the females being slightly more in disagreement with donor egg conceived children are at

a greater risk of being expelled from school than naturally conceived.

A 2 Gender by 2 Participants (Iranian and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 10. There was a significant main effect for Gender $F(1, 103) = 4.13$, $MSE = 0.37$, $p = 0.04$, $\eta_p^2 = 0.039$ but not for Participants. There was, however, a significant Interaction effect with $F(1,103) = 9.83$, $MSE = 0.37$, $p = 0.002$ and $\eta_p^2 = 0.08$.

Analysis of simple effects using independent groups t-test showed no significant difference between Iranian males and females however, there was a significant difference between British males and females, with $t(51) = -2.91$, $p = 0.004$ indicating that the British male more than the British female agreed with the statement. See figure below for the responses of Iranian and British public to statement 10:

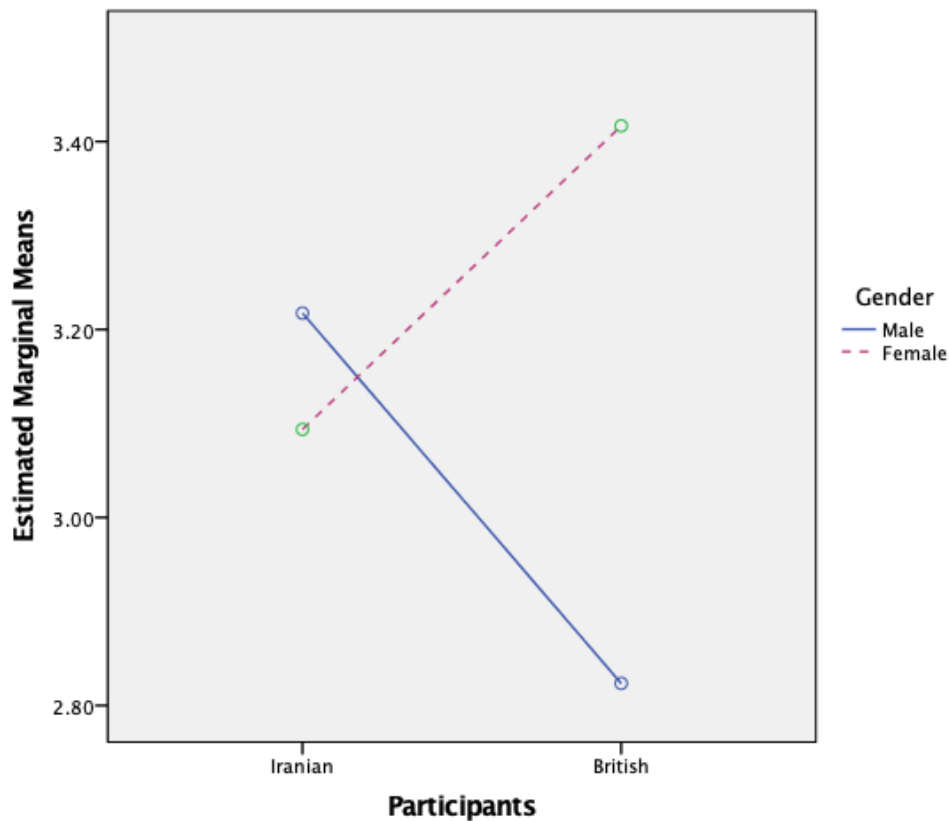


Figure 5. 20: A graphic display of the responses of Iranian and British public to statement 10 “Donor egg conceived children are at greater risk of being expelled from school than naturally conceived children”

Statement 11: Donor egg conceived children might experience overt prejudice from the wider community, relatives and friends

Responses of Iranian and British mothers with donor egg children to statement 11:

The mean score of mothers with donor egg children were 3.0 for Iranians and 3.75 for British which means that British were more in disagreement with donor egg conceived children may experience overt prejudice from the wider community, relatives and friends. See figure below for the statement 11:

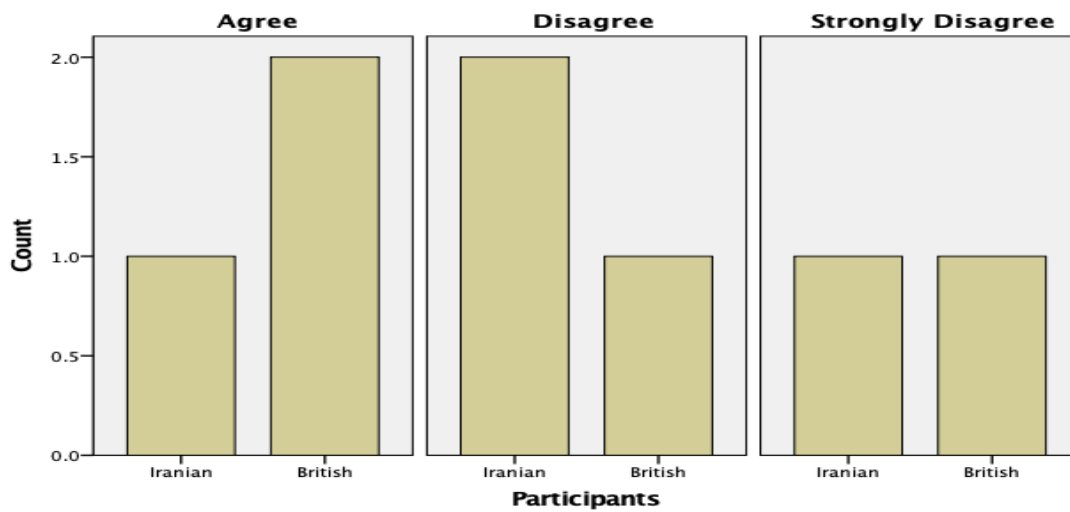


Figure 5. 21: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 11 “Donor egg conceived children might experience overt prejudice from the wider community, relatives and friends”. The higher the rating the more disagreement with the statement

Table 5. 11 Mean (SD) for responses of Iranian and British public to statement 11

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	1.95 (SD = 0.87)	2.23 (SD = 0.75)
Female	2.12 (SD = 0.79)	2.75 (SD = 0.84)

As can be seen in table 5.11 there was a difference between males and females and between the two groups of Iranians and British i.e., females more than males and British more than Iranians were in disagreement with donor egg conceived children might experience overt prejudice from the wider community, relatives and friends.

A 2 Gender by 2 Participants (Iranians and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 11. There was a significant main effect for Gender $F(1, 103) = 5.64, MSE = 0.61, p = 0.01, \eta_p^2 = 0.04$ and for Participants $F(1, 103) = 13.95, MSE = 0.61, p = 0.001, \eta_p^2 = 0.11$. There was however, no significant Interaction effect. See figure below for the responses of Iranian and British public to statement 11:

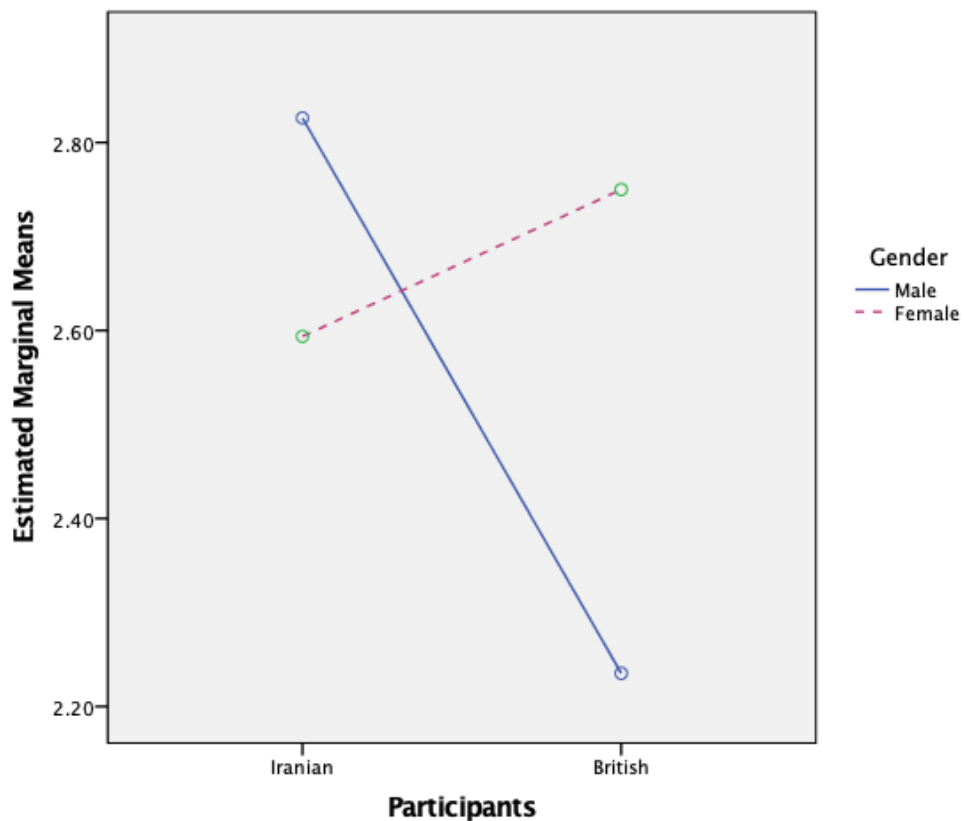


Figure 5. 22: A graphic display of the responses of Iranian and British public to statement 11 “Donor egg conceived children might experience overt prejudice from the wider community, relatives and friends”

Statement 12: Teachers should be informed of which children in their class have been born by egg donation

Responses of Iranian and British mothers with donor egg children to statement 12:

The mean score of mothers with donor egg children were 3.0 for Iranians and 3.75 for British, which showed that the general tendency for both cultural groups was towards disagreement and strongly disagreement part of the scale. However, British mothers were slightly more in disagreement with sharing information about the child's biological origins with teachers than Iranian mothers (see also Pir Jalian, 2017). See figure below for the statement 12:

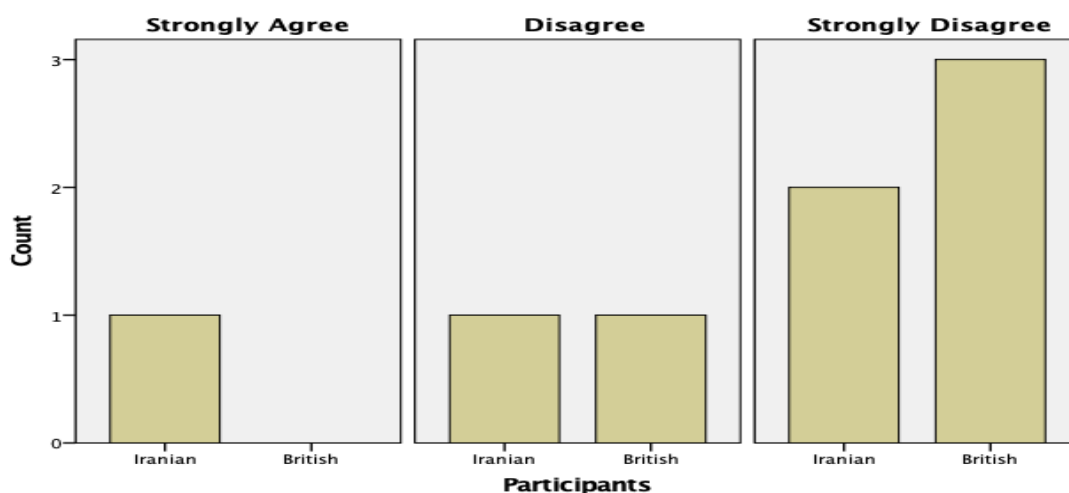


Figure 5. 23: A graphic display of the number of responses of Iranian and British mothers with donor egg children to statement 12 “Teachers should be informed of which children in their class have been born by egg donation”. The higher the rating the more disagreement with the statement

Table 5. 12 Mean (SD) for responses of Iranian and British public to statement 12

Gender	Iranians/Mean (SD)	British/Mean (SD)
Male	3.12 (SD = 0.89)	2.88 (SD = 1.07)
Female	2.96 (SD = 0.88)	3.60 (SD = 0.55)

As can be seen in table 5. 12 it seems that there was no difference between males and females and both British and Iranian groups. However, a significant interaction effect as depicted in figure 12 showed that there was a difference between British males and females with the females more strongly in disagreement with sharing information about children's biological origins with teachers.

A 2 Gender by 2 Participants (Iranian and British) Factorial ANOVA (using age as Covariate) was conducted on the responses to statement 12. There was no significant main effect for Gender and for Participants. There was, however, a significant Interaction effect with $F(1,104) = 7.39$, $MSE = 0.69$, $p = 0.008$ and $\eta_p^2 = 0.06$.

Analysis of simple effects using independent groups t-test showed no significant difference between Iranian males and females, however, a significant difference between British males and females with $t(51) = -3.18$ and $p = 0.002$ indicating that the British males agreed more than their female counterparts with the statement. See figure below for the responses of Iranian and British public to statement 12:

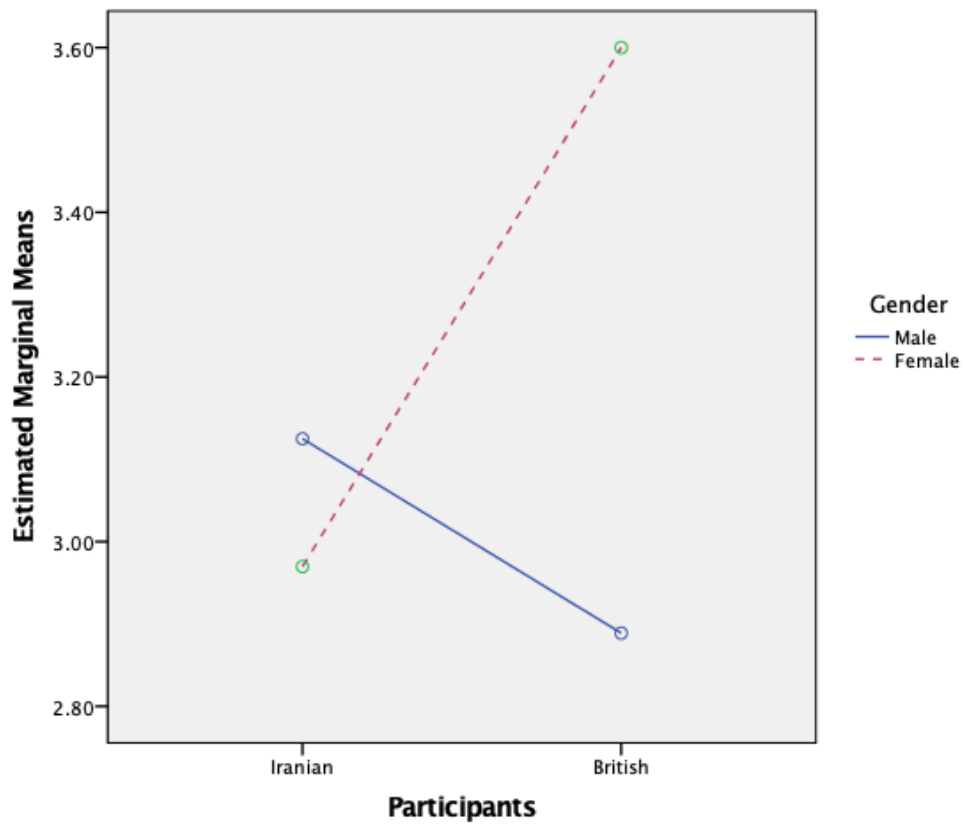


Figure 5. 24: A graphic display of the responses of Iranian and British public to statement 12 “Teachers should be informed of which children in their class have been born by egg donation”

The Independent Groups T-tests for the Independent Variable “whether the public taking part in the study have children or not”

A series of independent groups T-tests was conducted on each statement, which only two statements “Donor egg conceived children are generally unhappier compared to naturally conceived children” and “Teachers should be informed of which children in their class have been born by egg donation” were significant at 0.05 and 0.04 respectively. However, using Bonferroni correction, setting alpha at 0.004, none of the latter was significant. Thus, it could be the case that the two significant results were due to chance factors and it could be the case that public perceptions on all of the items were not affected whether the participants had a child or not. See table 5.13 below for the Mean and Standard Deviation and Number of participants for the independent variable “whether the public have children or not”:

Table 5. 13 Mean and Standard Deviation and Number of participants for the independent variable “whether the public have children or not”

Statements	Having children	N	Mean	Std. Deviation
1- Childhood illness	Yes	48	2.64	0.91
	No	68	2.85	0.75
2- More genes from fathers	Yes	49	2.69	0.91
	No	69	2.94	0.85
3- Being infertile in future	Yes	48	2.95	0.94
	No	66	3.06	0.69
4- Lack of genetic link	Yes	48	2.79	0.79
	No	68	3.00	0.64
5- Being unhappy	Yes	49	2.93	0.85
	No	67	3.20	0.64
6- Risk of Autism	Yes	46	3.04	0.81
	No	66	3.09	0.71
7- Lower self-esteem	Yes	49	3.14	0.64
	No	67	3.11	0.72
8- Children should be told	Yes	48	2.31	0.80
	No	68	2.47	1.01
9- Lower IQ scores	Yes	48	3.29	0.58
	No	68	3.23	0.60
10- More expelled from school	Yes	49	3.30	0.58
	No	67	3.19	0.70
11- Experience prejudice	Yes	49	2.28	0.88
	No	67	2.35	0.86
12- Teachers should be told	Yes	49	3.02	0.92
	No	69	3.34	0.83

5.7.3 The Results of Qualitative Analysis

5.7.3.1 Content Analysis of the Comments to the 12 Statements

The total number of 121 participants, 63 Iranian (Male = 26, Female = 37, Mean age = 42.91, SD = 13.58) and 58 British (Male = 19, Female = 39, Mean age = 32.36, SD= 14.02) in which 8 participants (4 Iranian and 4 British) were mothers with donor egg children of primary school age that were asked to add any additional comments if they wished to justify their responses to the 12 statements (see Appendix A for the full comments).

The results showed that from a total of 139 comments, 105 belonged to the Iranians and 34 to the British. The Iranians commented that psychological factors such as mother's stress during pregnancy, environmental issues such as problems at school, nutrition, assisted reproduction by itself, disclosure to people and to the donor egg child about the precise nature of conception and genetic inheritance might cause psychological problems in children conceived by egg donation.

However, the British commented that family relationship and parents' behaviour, lack of disclosure to children about their biological origins (versus Iranians) and genetic factors were the most important issues that might cause psychological problems for children born by egg donation. See table 5.14 for the Iranian and British comments to the 12 statements:

Table 5. 14 The Number of Iranian and British comments to the 12 statements to justify their responses and how it was categorised (also in percentages as per category)

Iranians: 105 Comments

Psychological/Stress	Environmental	Disclosure	Genetic	Miscellaneous
16	29	10	17	33
15%	27%	9.61%	16.34%	31.73%

British: 34 Comments

Family Relationship	Lack of Disclosure	Genetic	Miscellaneous
11	8	7	8
32.3%	23.52%	20.5%	23.52%

5.8 Discussion

The discussion of the results will take the following steps:

- a) A summary review for the quantitative and qualitative (content analysis) results of the questionnaire/statements and the key findings
- b) The interpretation of the findings in relation to each statement presented to the Iranians vs. the British, males vs. females and mothers (both Iranian and British) with children born by egg donation
- c) Interaction of public perception and fertility treatment
- d) The findings of study 1 as paving the way to study 2

5.8.1 A Summary Review of the Quantitative and Qualitative (Content Analysis) Results of the Questionnaire/Statements and the Key Findings

In the absence of any published research, the present study investigated Iranian and British men and women's perception of donor egg conceived children. Furthermore, the perceptions of mothers with children conceived via egg donation, and the extent to which the latter views differ from a cross-cultural perspective, was investigated. Comparison of the Iranian and the British men and women showed interesting cultural as well as gender differences.

5.8.1.1 Responses of the Mothers with a Donor Egg Child and the Public (Quantitative Results)

The responses from the eight mothers with a donor egg child, from a purely descriptive view due to small sample size, indicated that the Iranian mothers with a

donor egg child more than their British counterparts agreed that conception via egg donation may have medical, psychological and social problems. The reasons put forward were the lack of genetic link, being unhappier than naturally born, and may experience overt prejudice from the wider community, relatives and friends. Also, Iranian mothers with a donor conceived child were more in agreement than their British counterparts that teachers should have knowledge of which child in their classroom has been born by egg donation (see also Pir Jalian, 2017).

Overall, the responses of 113 participants showed that (Iranian and British men and women) the men more than the women and the Iranians more than the British agreed that children conceived via egg donation may have more medical, psychological and social problems than naturally born. It seems that the Iranian views of children born by egg donation are closer to the items of the statements that were presented to the participants based on scientific research findings.

As explained previously, the items were selected from previous scientific research findings e.g., “Donor egg conceived children are generally unhappier than naturally conceived children”. It should be acknowledged that not all scientists have come to this conclusion and future research may refute this claim, nevertheless, such lines of investigation on the consequences of egg donor born children have taken considerable attention. In fact, the British showed that in spite of the wording of the statements they do not agree with the research findings on most of the statements presented to them in this study.

It appears that the Iranians, compared to the British, have different perceptions of donor egg conceived children, possibly due to cultural differences, religious

restrictions and cultural negativity to egg donation. The reasons put forward in the comments made by Iranians were that donor egg conceived children, due to the lack of genetic link, are likely to be unhappier than naturally born and suffer from overt prejudice from the wider community. Interesting to note that when data was analysed for whether the respondents had children or not there were only two significant differences, namely on the subject of donor conceived children could be unhappier than naturally conceived and whether or not teachers should be told which child is by donor egg. The significance level after Bonferroni correction did not justify an acceptable level. Thus, it could be the case that public perceptions on all of the items were not affected whether the participants had a child or not.

5.8.1.2 Content Analysis of the Responses of the Iranian and British Public and Mothers with a Donor Egg Child (Qualitative Results)

Indeed, the content analysis of the comments given by both the Iranian and British mothers with a donor egg child and the public who participated in the study suggested that the Iranians believed that stress during pregnancy may affect the mother psychologically. In addition, the environmental issues such as problems at school, nutrition, assisted reproduction by itself, disclosure to people and to the donor egg child about the precise nature of conception and genetic inheritance might cause psychological problems in children conceived by egg donation.

However, for the British participants, family relationship and parents' behaviour, lack of disclosure to children about their biological origins (versus Iranians) and genetic factors were the most important issues that might cause problems (psychological, medical or social) for children born by egg donation (see table 5.14).

5.8.2 The Interpretation of the Quantitative and Qualitative Findings in Relation to each Statement Presented to the Iranians vs. the British, Males vs. Females and Mothers with Children Born by Egg Donation both the Iranians and the British

In what follows there is an attempt to interpret the findings from both quantitative and qualitative perspectives of the present study. One option is to first report and interpret all the quantitative research findings for all the 12 items, followed by qualitative research findings. However, as the intention of using content analysis was to provide a complementary explanation to the quantitative responses to each statement relating to quantitative findings is immediately followed by qualitative findings.

Statement 1: Donor egg conceived children have more childhood illnesses and medical care compared to naturally conceived children

In this study the Iranians more than the British and the men more than the women agreed with having more childhood illness in children born by egg donation than naturally conceived. Although, not specifically addressing egg donation, Lu, Wang and Jin (2013) in a review of long-term follow-up of children conceived through ART concluded that generally ART conceived children are more likely to have childhood illnesses. For example, having a significantly higher risk of requiring medical care, being admitted to hospital and surgery (see also Ludwig et al., 2009; Zhan et al., 2013).

However, it appears that this is not a view shared by women generally or by the British public. There are numerous reports of the extent to which women value having children (by whatever means). For instance, Graham, Smith and Shield (2015)

reported, “A positive attitude by women towards the importance of children in one’s life increased the likelihood of future motherhood”. However, one cannot ignore the cultural point of view and that Iranians (even the women in the study) could still demonstrate negative perceptions towards the statement, because of what was said in previous chapters, for example, a lack of genetic link. Thus, attention to the specific responses given to this particular statement may give a clearer answer for the pattern of results reported.

Whilst the British gave very little comments to justify their responses mainly due to “family relationships”, the Iranians however, had more comments to make. They emphasised that stress and psychological factors, as well as lack of genetic links and concerns about what the society thinks about their child and their actions, are responsible for childhood illnesses!

Statement 2: Donor egg children inherit most of their genes from their father

Generally, the Iranians more than the British and the men more than the women agreed that the male’s genes play a more important role than female in producing a child. As in line with the previous statement, it appears that a view of “children born by egg donation inherit their genes mainly from their father” is not a view shared by women generally or by the British public. Interesting to note is that the findings that Iranians overall believe that men’s genes play a more important role in conception is in contradiction with historical views dating back to 1700 BC. This is the time of the prophet Zoroaster and his commandments that indicated that the ancient Persians believed in the equal contribution of women and men toward producing a child, and all its hereditary characteristics (Kariminejad & Khorshidian, 2012).

In years that followed in the 10th century, Iran's national poet, Ferdowsi (940 – 1020 CE), also expressed the same view and commented on the “equal contribution of man and woman in the production of the fetus and transmission of characters”. Centuries later, Western philosophers’ beliefs in regard to reproduction were contrary to Persian ancient knowledge. The Greek philosophers for example believed that man's water (semen) contains all human characteristics, and the female uterus is only responsible for the nurturing and development of the fetus (see e.g., Kariminejad & Khorshidian, 2012). However, it seems that with time, and perhaps invasion by Islam, the view has been significantly changed in Iran whilst at the same time it seems that the Western views also changed in a different way leading to what the ancient Persians believed in 1700 BC! However, looking at some of the modern day views, as reported by Crowley et al. on 2015, it seems that the view of what role the father’s genes plays seems to be an ever changing story “we use more male inherited genes and although we inherit equal amounts of genetic mutations from our parents, we actually use more of the DNA that we inherit from our fathers” (Crowley et al., 2015).

Again, as with the previous statement, content analysis in the present study showed very few comments by the British and not so much from the Iranians. Basically, the comments were not very informative with the few comments made that “it is equal contribution”!

Statement 3: Donor egg conceived children are more likely to be infertile themselves than naturally conceived children

Generally, no significant differences were found between Iranians and British and between men and women, but the significant interaction indicated that British women more than their male counterparts are in stronger disagreement on the subject of egg

donor conceived children being more infertile. However, scientific research shows there are reasons to believe that the statement may have some credibility. The reasons put forward by scientists are too technical and beyond the scope of this research (see e.g., Lu, Wang & Jin 2013; van Steirteghem, 2010). A research in 2015, however, has summarised some of these findings “mothers who use donor eggs may actually pass some of their genetic material on to their children through their endometrium fluid (the endometrium fluid, which is the liquid that surrounds the developing fetus) and this is also true of surrogates who carry another woman’s eggs” (<https://lehmannhaupt.com/2016/01/06/becoming-a-solo-mom-via-assisted-reproductive-technology-donor-eggs/>).

Again, as with the previous statements, content analysis showed that very little was said by the British, who mainly commented that it was due to biological or genetic factors as being responsible for future infertility of donor egg children. The Iranians, however, had more comments, emphasising again on the stress and psychological, biological and lack of genetic link as the cause of infertility in the future for a child born by egg donation.

Statement 4: Donor egg conceived children with a lack of genetic link (egg or sperm donation) results in psychological adjustment problems

Overall, there was no difference between the two nationalities and the two genders in disagreement with the statement that the lack of genetic link might cause psychological problems in children born by egg donation. Interesting to see that the British in the present study are not as much concerned about the lack of genetic links contrary to what most “Western” based research suggests. As reported earlier, it has been suggested that third party involvement families may have negative effects for the

children due to the lack of a genetic link (Golombok, Blake, Casey, Roman & Jadv, 2013). Interesting to note that such findings have arisen largely from Western countries, which seems to have given more credibility to genetic link in the creation of third party families over families with no third party involvement (Daniluk & Koert, 2012; Freeman, Graham, Ebtehaj & Richards, 2014).

In addition, a research found that women who do not have a genetic connection with their offspring made slightly less eye contact with their babies and responded less to their games! The researchers explained that egg donation mothers are struggling with the idea of not having a genetic relationship with their baby, thus, holding different significance to their interaction with their baby (Imrie, Jadv, Fishel & Golombok, 2019) (see also <https://www.telegraph.co.uk/science/2018/10/09/mothers-use-donor-eggs-interact-differently-offspring-new-study/>).

Another example is the study conducted by Murray, MacCallum and Golombok (2006) with 35 donor insemination families, 17 egg donation families and 34 IVF families with a 12-year-old child reported that they reflected lower levels of sensitive responses of egg donation mothers toward their children compared with IVF mothers implying that these lower responses might have a negative effect for the resulting child.

However, as mentioned earlier, in the present study the Iranian mothers with children born by egg donation agreed that the lack of genetic link in a donor egg child results in psychological problems.

In the content analysis, the British commented that family relationships and lack of disclosure to the child are the factors that might make more psychological problems for the child. However, the Iranians commented again that the lack of genetic link and disclosure to the child may indeed cause psychological problems for the resulting child of egg donation.

Statement 5: Donor egg conceived children are generally unhappier compared to naturally conceived children

The results showed that there was no difference between the Iranians and the British in disagreement with the statement. There was, however, a significant main effect for gender with men more than women in agreement with the statement and significant interaction indicating that British men more than British women agreed that donor egg children are unhappier than naturally born. This statement was in view of research on IVF born children in their teens indicating that 8-9 year old children by IVF show withdrawal symptoms and depression as observed by teachers and reported by their parents (Wagenaar et al., 2009). However, more scientific research is needed especially on donor conceived children. The written responses given by the participants showed that the British felt that family relationships may be responsible, however, the Iranians focused on environmental factors and disclosure to the child as the cause of being unhappier in donor egg children.

Statement 6: Donor egg conceived children are at higher risk of autism than naturally conceived children

Generally, the only significant difference was on gender with more men agreeing with the statement than women of higher incidence of autism in donor egg children compared to naturally born. This statement was in response to research indicating that

generally the use of ART might be associated with higher risk of Autism Spectrum Disorders (ASD) in the offspring (Gao, He, Cai, Wang & Fan, 2017). Other researchers in a meta-analysis of the total 11 records (3 cohort studies and 8 case-control studies) revealed that the use of ART is associated with higher percentage of ASD (see also Zhan et al., 2013). Fountain et al. (2015) maintained that for pregnancies conceived with ART, the increased risk for ASD, in large part, is due to the higher likelihood of adverse pregnancy and delivery outcomes. Autism related to IVF procedure compared to donation may also be age related, as most women are older when they go for egg donation. It may be the case that the older age may contribute to autism.

The British comments on this item were mostly related to genetic factors and the Iranians emphasised again on the environmental and genetic factors as being responsible for the autism in children born by egg donation.

Statement 7: Donor egg conceived children have lower self-esteem than naturally conceived children

Generally, there was no difference between the Iranians and the British in disagreement with the statement, but this time Iranian men more than the Iranian women disagreed with lower self-esteem in donor egg children. This statement was in response to a study by Zhan et al. (2013) in which it was argued that psychological well-being in ART conceived children may result in lower self-esteem in adolescents born following IVF than in the control group.

The content analysis showed that the British commented on family relationships and the Iranians believed environment and nurture, disclosure to the child and society are the factors that can cause lower self-esteem in children born by egg donation.

Statement 8: Donor egg conceived children should be told about the precise nature of their conception

Overall, there was no difference between the Iranians and the British and men and women in responses to this statement. This statement was in response to research indicating the significance of telling the child of his/her biological origins. While most countries are in favour of protecting donor anonymity, a trend towards disclosure of donor identity to offspring is growing in other countries (see e.g., Ravitsky, 2010). The first generation of donor-conceived offspring describe a strong need to know “where they came from”, to know their genetic origins as an essential part of constructing their identities (Ravitsky, 2010). Golombok et al. (2011) argued that mothers in non-disclosing egg donation families showed less positive interaction with their children than mothers in natural conception families, suggesting families may benefit from openness about the child’s genetic origins (see also Zadeh, 2016).

MacCallum and Golombok (2007) conducted a survey on whether the child is told of his/her origins and reported that from the recruited sample, 9% of mothers had told their child how they had been conceived, 24% of mothers reported that they were planning to tell the child in future, 43% had decided that they would never tell the child, and the remaining 24% were undecided. However, nearly three-quarter of mothers (72%) had disclosed to other family members. Stobel-Richter, Goldschmidt, Brahler, Weidner and Beutel (2009) reported that in their study in Germany over 38%

of men and women commented that a child should know of his/her origins and had the right to get to know his or her genetic parents.

There is of course the Human Fertilisation and Embryology (Disclosure of Donor Information) regulations that in 2004 removed the right of gamete donors to anonymity and gave donor-conceived offspring a legal right to identify, and possibly contact their donors on reaching the age of 18. The legislation was introduced because it was believed that donor-conceived-offspring have a right to information about themselves, including their genetic identity, and that denying them this information is harmful. Considerable emphasis was placed on the interests, needs and rights of the donor-conceived-offspring to access their genetic identity, and potentially contact their donors and donor-siblings (Hewitt, 2015).

The results of the content analysis showed the few comments made by the British emphasised on being more honest and to disclose to the child his origins, which may result in strengthening bonding between mother and child. However, the Iranians commented mostly on being secret and not to disclose to the children about their origins.

Statement 9: Donor egg conceived children have lower IQ scores than naturally conceived children

Overall, there was no difference between the Iranians and the British and between men and women on the statement of lower IQ scores of donor conceived children, but the significant interaction effect showed that British men more than their women counterparts believe this to be the case. This statement was taken in response to a study by Zhan et al. (2013) in which, they argued that ART conceived children have

lower IQ scores than children in the control group. No study has aimed at donor conceived children and IQ scores.

The content analysis of responses showed that the British commented that this is due to family relationships, however, the Iranians again mostly focused on genetic and environmental factors as well as disclosure to the children being responsible for the lower IQ scores on donor egg conceived children.

Statement 10: Donor egg conceived children are at a greater risk of being expelled from school than naturally conceived children

Generally, there was no significant difference between the Iranians and the British and between men and women on this statement. However, the significant interaction effect showed that British men more than British women agreed that more donor egg conceived children may be expelled from school than naturally born. This statement is in line with research, which indicated that ART children are more likely to be expelled from school (Zhan et al., 2013). Also, research indicated that teenagers born through ART might be more prone to aggression and conduct problems at school than other youngsters (The Sydney Morning Herald, <https://www.smh.com.au/national/ivf-kids-more-prone-to-aggression-study20081022-55nd.html>).

The content analysis of the responses showed that the British are more concerned about family relationships as the main cause of being expelled from school, and the Iranians mostly commented on psychological problems and whether it is the disclosure to the child and to others that may cause children at risk of being expelled from school.

Statement 11: Donor egg conceived children might experience overt prejudice from the wider community, relatives and friends

Generally, the Iranians more than the British and the men more than the women agreed with the experience of overt prejudice from the society in donor egg conceived children. This statement was in line with the studies of Fasouliotis and Schenker (1999), Golombok, Cook, Bish and Murray (1995) and McNair (2004). These researchers indicated that ART children might experience overt prejudice from the public. In the present study the Iranians more than the British agreed with the statement perhaps due to their negative attitude towards donor egg children (Abbasi-Shavazi, Inhorn, Razeghi-Nasrabad & Toloo, 2008; Abbasi-Shavazi, Nasrabad, Ardekani & Akhondi, 2006; Tremayne, 2012).

The content analysis of the responses showed that the British commented that lack of disclosure might be a factor that causes the child to experience overt prejudice from the society. However, the Iranians commented that if the children and other people know about the child's origins this might cause them to experience overt prejudice from the society.

Statement 12: Teachers should be informed of which children in their class have been born by egg donation

Generally, the Iranians more than the British and the men more than the women agreed that teachers should be told about the biological origins of the donor egg children. Although there is no specific research that telling or not telling the teacher may cause problems for the child or the school, there are indirect reasons to believe that this should be a subject for investigation. If the arguments put forward in the review of the literature about possible psychological or medical or social problems of

children born by ART is true (e.g., Beydoun et al., 2010; Wagenaar et al., 2009; Zhan et al., 2013; Pinborg, 2019), then one may argue that the teacher should be informed of the origins of the child. This could help the teacher when facing a problematic child, to respond better to the child's needs and to take the best course of action to deal with the problem. This could be a valid reason for follow up studies on this topic and indeed on how teachers' perceptions about the children with regards to their gender, ethnicity and origins may affect their judgment [see e.g., Cline and Ertubey (1997) for how the child's gender may affect teachers' perception]. Indeed, Pir Jalian (2017) reported on the significance of cultural factors and argued that the negative feelings that Iranian mothers may have about conception by egg donation may reflect itself in their tendency for the information to be shared with teachers.

The content analysis also showed that the British maintained that it should be left to the child or parents to decide and not a major concern to the school unless it is necessary. However, Iranians' comments were more mixed, ranging from "being a sensitive issue", "only parents should know and nobody else" to "teachers and everybody should know".

5.8.3 Interaction of Public Perception and Fertility Treatment

The present findings have significance for practitioners and scientists in providing what are the key conceptions and misconceptions about ART, and the possible cultural and gender divide on such issues. For any treatment method on infertile patients to be successful, an understanding of the patients' beliefs, perception and level of knowledge play an important role. As Goldfarb (2019) stated that

understanding the public attitudes regarding management of infertility patients is relevant and necessary.

As the results of the present study have shown there is a significant divide between Iranians and British with regard to consequences of children born by egg donation. Such differences may have an impact on the child from the time of birth to entering into the society (e.g., Pir Jalian 2017). Similarly, the results have implications for scientists engaged in research in various aspects of ART. This would help to understand whether the public share the view that for example, being born by egg donation could result in more incidences of autism, being more infertile in the future and being expelled from school more than naturally born. This is indeed a good starting point for scientists to see the reasons for the public misconception and find ways of tackling the problem and taking into account public beliefs and perception.

5.8.4 The Findings of Study 1 as Paving the Way to Study 2

The present study highlighted the significance of cultural differences as a factor affecting peoples' perceptions about a sensitive topic of conception by egg donation. Furthermore, it has raised the issue that Iranian women in particular with a child born as a result of egg donation may have many concerns about how the child will be perceived in the society, the secrecy surrounding genetic links and the child's identity. Hence, the present study has raised the issue of whether these concerns may show their roots in the maternal bonding and health beliefs and health practices during pregnancy of women with conception via egg donation.

5.9 Limitations

There is of course the general limitation that is associated with any cross-cultural research and questions raised about the reliability and validity of the results. For example, how comparable is the translation of items in a questionnaire in two distinctive cultures (e.g., collectivism vs. individualism) and the differences in language structure and semantics? To what extent, for example, expressions of feelings can have the same semantics in contrasting cultures? (Halder, Binder, Stiller & Gregson, 2016). However, as mentioned in the procedure of study 1, all possible factors affecting the reliability and validity of the results were tackled to the best of the author's ability.

There are, however, more specific aspects of the study that should be discussed. One suggestion was to engage in Principal Components Analysis of the 12 statements and combine the 12 items into separate factors. For example, a factor labelled as "Psychological" or "Medical" each consisting of 2 or more items from the 12-item questionnaire. Firstly, it was noted that a clear factor representing items all under a specific label e.g., "Psychological" was not possible. Secondly, it was soon evident that any analysis on just 2 or 3 factors under different labels would have totally diverted from the main aim of the thesis, namely public and mothers of donor conceived children perceptions of a wide range of psychological, medical and social consequences. Indeed, in this fashion of analysis the responses to each statement will have the potential of reporting in its own right as a scientific finding (e.g., Pir Jalian 2017).

Another point to report here is the small sample size, particularly mothers with children born by egg donation. This was unavoidable, especially with regard to Iranian mothers, as the issue of secrecy was the key barrier in taking part. Also, the aim was to involve the partners of the women with a child conceived by egg donation in taking part in the study. Iranian mothers maintained that they would take part if it would not involve their husband. Follow up research may seek to find an answer for such reluctance.

Finally, it would have been ideal to have as many variables as possible included in the study, such as whether or not the participants have tried or know anyone involved in ART/egg donation. As explained previously, it was soon found to be too much to ask, particularly from the Iranian public, and would have affected the sincerity of the responses.

5.10 Summary of the Chapter and Conclusion

The present chapter reported a study on the perceptions of the Iranian and British men and women and mothers of donor conceived children (both the Iranians and British) on the consequences of children born by egg donation. The statements presented to participants stemmed mainly from scientific research on psychological, medical and social consequences of children born by egg donation. Using a questionnaire Likert scale and also asking people to comment on their responses led to several interesting findings. Most significantly the belief that concerns of genetic link between mother and child, as well as how the public perceive a child born by egg donation, may be factors affecting mothers who have conceived by donor egg during their pregnancy.

Overall analysis of the results of study 1 indicated that although Iranian mothers have gone through the process of having a child by egg donation (possibly due to cultural pressure) they nevertheless may have strong reservations about the consequences, particularly social and cultural factors. This raised the question of whether this dissociation between feelings and actions may manifest itself in the maternal bonding between mother and fetus during pregnancy. This is the subject of the next study. However, before that there is a need to emphasise on the conclusion drawn from this study and the need to assess public perceptions on a sensitive topic of scientific developments on human reproduction.

The significance of having children in Iran, and the possible cultural difference between Iran (Eastern) and Britain (Western), led to raising important differences between the two contrasting cultures on subjects ranging from the genetic link, the child's happiness as well as social prejudice. Time will tell if the present results might change when more children born by ART and egg donation enter the society and even with more medical advances in this area of human reproduction. At the time of Louise Brown era, the comments made were negative "not all scientific advances are good for the humanity". In a very recent article, decades later, the issue is still raised as "How new technologies are 'disrupting' human reproduction" (<https://geneticliteracyproject.org/2018/12/21/how-new-technologies-are-disrupting-human-reproduction/>). It seems that the quest for an answer still goes on!

Chapter 6

Study 2: Conception by Egg Donation: Maternal Bonding and Health Practices

6.1 Preface

The rationale for conducting study 2 goes back to 2013 in which, Pir Jalian (2013) reported a general reluctance on behalf of Iranian women to agree to donate their eggs to help infertile women achieve conception. Interesting to note that this was in spite of research suggesting that women from South East Asia showed more favourable views about donating their eggs (Purewal & van den Akker, 2009). Pir Jalian's study, however, incorporated a condition in which, women were told about the possible medical consequences of undergoing the process of egg donation. It was thus clear a) there may be clear differences in Iranian women's actions and beliefs with regards to egg donation and conception as compared to other even similar cultures and b) women seem to be affected by having knowledge about what are the consequences of medical interventions insofar as egg donation and conception are concerned.

Adding to this earlier line of research are the findings from study 1 indicating that although the four Iranian mothers have gone through the process of having a child by egg donation they nevertheless have strong reservations about the consequences of having children born by egg donation.

This raised the question of whether this dissociation between feelings and actions may manifest itself in the maternal bonding between mother and the fetus during pregnancy. Therefore, study 2 aimed to explore maternal bonding between mother and fetus (i.e., feelings and emotions for her fetus, interaction with her fetus) in Iranian pregnant women via egg donation and naturally through the Maternal-Fetal Attachment (MFA) (Cranley, 1981), Fetal Health Locus of Control (FHLC) (Labs & Wurtele, 1986) and Maternal Health Practices (MHP) (Lindgren, 2005).

It is worth noting that there has been no reported research, particularly on Iranian women pregnant via egg donation and naturally, on the actual bonding process between mother and fetus during pregnancy.

6.2 Introduction

The relationship between mother and child born by ART could be studied from at least two different perspectives: First, in terms of parent-child relationship after childbirth in IVF conception families. In that case, generally, research shows that there is no difference between IVF family relationship compared to natural or spontaneous families (see e.g., Colpin & Soenen, 2002; Gibson, Ungerer, McMahon, Leslie & Saunders, 2000; Golombok, Owen, Blake, Murray & Jadva, 2009; van Balen, 1998). Second, in terms of mother and fetus relationship or bonding during pregnancy as a result of IVF conception. The results of studies on maternal-fetal bonding during IVF pregnancies show different results. Some research shows that there is no difference between IVF mothers and naturally pregnant women on maternal bonding as assessed with MFA scale (see e.g., Hjelmstedt, Widström & Collins, 2006; McMahon, Ungerer, Beaurepaire, Tennant & Saunders, 1997; Stanton & Golombok, 1993). Others have shown strong attachment levels to the fetus for IVF women and concluded that this is due to the emotional investment put into having the baby in the first place (Lind, Pruitt & Greenfeld, 1989; McMahon et al., 2011).

There is also the option of studying both lines of research mentioned above if the child is conceived via egg donation. In view of family relationship in egg donation families, research shows that generally there is no difference between these families and other families created by other means, such as natural or other ART procedures (see e.g., Golombok et al., 2011; Golombok et al., 2004; Golombok, Ilioi, Blake, Roman & Jadva, 2017; Golombok, Jadva, Lycett, Murray & MacCallum, 2005; Golombok, Murray, Jadva, MacCallum & Lycett, 2004). However, Imrie, Jadva, Fishel and Golombok (2019) reported observational assessment of mother–infant

relationship quality in 85 egg donation families and a comparison group of 65 in vitro fertilization families. Women who conceived a child by egg donation made slightly less eye contact with their babies and responded less to their games compared to the IVF conceived women (see also Murray, MacCallum & Golombok, 2006; <https://www.telegraph.co.uk/science/2018/10/09/mothers-use-donor-eggs-interact-differently-offspring-new-study/>).

In terms of maternal bonding during pregnancy in egg donation conception mothers, there is little research in the literature. Pelski (2007) examined maternal-fetal attachment with MFA scale in 102 IVF pregnant women who conceived with their own eggs and 11 women who conceived with donor eggs. The researcher recruited the sample from two on-line support groups, Resolve and Shared Journey, and indicated that no significant differences were found in maternal attachment during pregnancy between donor egg pregnant women and women who conceived with their own eggs.

Based on the above review, several issues arise that begs the question of investigating maternal-fetal attachment and bonding amongst Iranian women. Most noticeable is the absence of any research on Iranian women. Furthermore, the fact that study 1 of this thesis had shown relatively strong negative perceptions towards children born by egg donation by the Iranian public, may raise the issue that women bonding with their donor conceived child may show a different pattern from that of studies in the West. However, prior to explaining in more detail the rationale of study 2, there is a need for a more in-depth review of maternal bonding and attachment literature and the psychometric tests/questionnaires used to measure the relationships.

6.3 Maternal Bonding and Attachment

Klaus and Kennell (1976) introduced the term “maternal bonding” to describe the idea that mothers are pre-disposed to form an affectionate bond to their baby prior to and during the sensitive period immediately following birth. More extensive definition of maternal bonding is defined as a process in which a pregnant woman experiences feelings and emotions, love and tenderness for her fetus (baby), interacts with her fetus and develops a maternal identity i.e., begins to identify herself as a mother. The bond between mother and her fetus is often referred to as maternal-fetal attachment or prenatal attachment by health professionals (Alhausen, Gross, Hayat, Woods & Sharps, 2012; Taylor & Wright, 2015).

Attachment in this context is referred to as the process of the bond from a child/infant to their parent/mother. Attachment develops over time through the developing relationship between the child and their parent/mother (Prior & Glaser, 2006). The origins of this term and the scientific background of what is known as the “Attachment Theory” could be seen through the works of Alan Bowlby (Bowlby, 1980; Bowlby, 1988).

Attachment theory developed by Bowlby (1980) explained early childhood development and mainly through observations of infants up to the age of six, showed that a human infant has a biological need for a protective attachment figure for survival, and absence of such a figure can cause psychological difficulties in the child’s emotional growth.

Bowlby (1988) further explained that a positive attachment experience led the child to form future relationships influenced by early childhood experiences. It endorses the feeling of approval by their caregiver making them feel good about themselves (e.g., “I am loved”) (Oppenheim & Goldsmith, 2011). Benoit (2004) argued that attachment is where the child uses the primary caregiver as a secure base from which to explore, and when necessary as a haven of safety and a source of comfort. In short, maternal bonding is the development of relationship from the mother to the fetus/baby whilst attachment describes the bond from a child towards their parent/mother.

The significance of understanding the maternal bonding and mother fetus/baby attachment has been the subject of intensive investigation, e.g., observations of the intense grief displayed by mothers of infants who died during birth. This observation marked one of the first empirical suggestions that a prenatal connection existed between a mother and her unborn child (Kennell, Slyter & Klaus, 1970). Klaus et al. (1972) demonstrated the detrimental effects of early separation between a mother and her child thereby focusing their efforts on interventions to enhance early postnatal attachment. These findings undoubtedly were the strong force behind extensive research on maternal bonding and attachment and to the development of tools to measure such relationships. One key focus being the development of measures that could aid with the maternal bonding and attachment during pregnancy (Yarcheski, Mahon & Yarcheski, 2009). In what follows three most influential concepts and tools/questionnaires as utilised in the present research are described.

6.4 Maternal-Fetal Attachment (MFA)

In 1981, Cranley created the theoretical construct of Maternal-Fetal Attachment (MFA) and defined MFA as “the extent to which women engage in behaviours that represent an affiliation and interaction with their unborn child” (Cranley, 1981, p. 282). MFA is the developing of the relationship between a pregnant woman and her fetus and Maternal-Fetal Attachment Scale (MFAS) includes items for example, “I picture myself feeding the baby” consists of five subscales of role taking, differentiation of self from the fetus, interaction with the fetus, attributing characteristics to the fetus and giving of self.

Cranley argued that the frequency and intensity of MFA behaviours increase with advancing gestational age, particularly after quickening (the moment in pregnancy when the pregnant woman starts to feel or perceive fetal movements in the uterus) at approximately 18 to 22 weeks of gestation. The rate and degree of MFA development appears to be influenced by gestational age at quickening, amount of fetal movement, pregnancy history and the mother’s own attachment history (Lerum & LoBiondo-Wood, 1989).

As the pregnancy progresses, the degree of maternal fetal attachment will naturally increase (Armstrong, 2002; Fisher, Hammarberg & Baker, 2008; Grace, 1989) and mothers demonstrating higher levels of MFA at the start are more likely to reach higher scores when infant attachment is measured at a later stage (Fuller, 1990).

A number of researchers have utilised the MFA as a measure of mother infant attachment and bonding (see e.g., Cannella, 2005; Martin, 2012). Most importantly is

that MFA is a significant predictor of positive health practices during pregnancy (Alhusen, Gross, Hayat, Woods & Sharps, 2012; Lindgren, 2001). Hence, the next two measures reported here are on the health beliefs and practices of mothers during pregnancy.

6.5 Fetal Health Locus of Control (FHLC)

The Locus of Control (LOC) concept is a personality dimension originally considered by Rotter. It is a measure of the degree to which individuals believe their lives are controlled by themselves (internal LOC) or outside factors (external LOC) (Rotter, 1966; Rotter, 1982).

Other researchers have developed Health Locus of Control (HLOC), which refer to LOC precisely related to health behaviours. That is, HLOC describes the belief that one's health is dependent upon internal and or external factors. As measured by the Multidimensional Health Locus of Control (MHLC) scale, HLOC consists of three major dimensions. Internal health locus of control (IHLC) refers to an individual's belief that his or her health is dependent upon his or her own behaviour, chance locus of control (CHLC) refers to the belief that chance factors determine health outcomes, and powerful others locus of control (PHLC) refers to an individual's belief that or his or her health is dependent upon the behaviours of powerful others such as medical doctors (Wallston, Strudler Wallston & DeVellis, 1978; Wallston & Wallston, 1982).

Researchers have indicated that IHLC is related to better physical and mental well-being and more positive health behaviours, CHLC is related to poorer physical and mental well-being and less positive health behaviours, and PHLC is related to

stronger devotion to medical recommendations (Bonetti et al., 2001; Pucheu, Consoli, D'Auzac, Français & Issad, 2004).

Health locus of control is one factor thought to influence health-related behaviour and psychological adjustment to illness (Wallston, 2005). Given the impact of the childbirth experience, assessment of maternal expectations of control over childbirth outcomes may be a clinically relevant component of antenatal care (Kornfeild, 2010).

The relationship between health locus of control and childbirth outcomes has become a particular focus of perinatal health research (Gray, 2005). For instance, does the woman see her newborn's health as a consequence of her own actions and thus under her control, under God, fate or chance control or is a function of the care she receives from professionals? Because relationships exist between the attitudes and beliefs a person holds and the various health behaviours they reveal (see e.g., Wurtele, Roberts & Leeper, 1982), a pregnant mother who lacks strong internal beliefs might jeopardize the health of her unborn baby (Labs & Wurtele, 1986).

The Fetal Health Locus of Control (FHLC) measures the extent to which pregnant women feel that the health of their unborn baby is related to internal (FHLC-I), external-chance (FHLC-C), and or external-powerful others (FHLC-P) (Labs & Wurtele, 1986). Researchers have found that internal FHLC correlates with positive health behaviours during pregnancy (Lindgren, 2001; Walker, Cooney & Riggs, 1999). Mothers with strong internal HLC beliefs were predicted to have a greater probability of joining health promoting activities and behaviours, whereas those with external HLC would be less likely to follow this path (Norman, Bennett, Smith & Murphy, 1998).

According to Özcan and Duyan (2015), women with an external fetal locus of control take more risks during pregnancy whereas pregnant women with internal fetal locus of control are more likely to change their lifestyles and adopt positive health behaviours. Other research indicated that stronger attachment to the fetus would be positively correlated with internal fetal health locus of control (Turrieff-Jonasson, 2004).

Research showed that infertile women compared to fertile women with inherent loss of control, are more likely to perceive themselves as controlled by external forces (Paulson, Haarmann, Salerno & Asmar, 1988) which negatively affect the health of mothers and their unborn baby (Wurtele, Roberts & Leeper, 1982). A study conducted by McMahon, Gibson, Leslie, Cohen and Tennant (2003) with 66 IVF parents compared with 46 matched naturally conceived control parents regarding psychosocial adjustment and parenting stress. The researchers reported that IVF mothers stated a more external locus of control than did control mothers but did not differ on other measures.

6.6 Maternal Health Practices (MHP)

Another factor known to influence pregnancy outcomes is the health practices that a mother engages in during pregnancy. Maternal Health Practices (MHP) is defined as actions a woman takes during pregnancy that affect her health, the health of the fetus, and later infant outcomes (Lindgren, 2001). Positive health practices include proactive measures such as seeking prenatal care, eating well, gaining the recommended amount of weight, obtaining dental care, and abstaining from tobacco, illegal drugs, and alcohol, obtaining adequate rest and sleep and engaging in regular exercise and

learning about pregnancy and childbirth (Feinberg, Jones, Kan & Goslin, 2010; Lindgren, 2001; Stutzman et al., 2010; Widen & Siega-Riz, 2010).

Several variables that correlate with improved health practices during pregnancy include levels of education and social status (Savage, Anthony, Lee, Kappesser & Rose, 2007; Webb, Siega-Riz & Dole, 2009). Research has shown that there is a strong relationship between maternal-fetal attachment, fetal health locus of control and maternal health practices (Kornfield, 2010). MFA is shown to relate strongly to internal health locus of control (Turriff-Jonasson, 2004), and to greater engagement in health practices (Lindgren, 2001; Lindgren, 2003; Maddahi & Dolatian, 2016).

6.7 MFA, FHLC and MHP in the Context of Assisted Reproductive Technology

Researchers have argued the desire to have a baby has a significant effect on mother/infant relationship. If, for example, women do not have a strong desire to have a baby, such feelings may reflect in emotions and health practices during and after pregnancy and demonstrations of less bonding and less likely to breastfeed (Cheng, Schwarz, Douglas & Horon, 2009). Linking this to assisted reproduction and pregnancy via IVF and donor egg, one may come up with two contrasting hypotheses: i) on one hand, women conceiving from IVF would demonstrate higher levels of MFA given the lengthy periods of infertility they have endured thereby raising their investment in the pregnancy (Alhusen, 2008), ii) on the other hand, if it is true that conception by egg donation is not the first port of call for women especially in Iran, then the expectation is that there are lower levels of MFA for women having

conceived by donor egg. Similarly, considering that there are relationships between MFA and health practices (Alhusen, Gross, Hayat, Woods & Sharps, 2012; Lindgren, 2001) the question could be raised as what are the health practices and fetal health locus of control levels for who women conceived by IVF, or egg donation compared to naturally conceived especially amongst Iranian women?

There has been little research conducted especially on donor egg conception and none on Iranian women. However, in IVF pregnancy, Hjelmstedt, Widström and Collins (2006) found no differences in MFA between 56 Swedish women conceiving via IVF versus 41 who conceived naturally. Stanton and Golombok (1993) using the maternal-fetal attachment scale and McMahon, Ungerer, Beaurepaire, Tennant and Saunders (1997) found no differences between IVF and naturally pregnant women in pregnancy emotional attachment. However, whilst there were no differences between these groups on maternal-fetal attachment, women who were less positive about pregnancy, childbirth and childcare show weaker attachment to their unborn child (Stanton & Golombok, 1993). McMahon, Tennant, Ungerer and Saunders (1999) found that IVF pregnant women who felt less positive about pregnancy compared to their control group had “fewer conversations” with the fetus during pregnancy. On the other hand, Lind, Pruitt and Greenfeld (1989) and McMahon et al. (2011) have reported intensive attachment levels to the fetus for IVF pregnant women and that is due to the emotional investment they put into having the baby in the first place. Thus, at least one factor that shows changes to the level of maternal-fetal attachment is how much women feel positive about their pregnancy. With regards to conception by egg donation, as explained before, Pelski (2007) reported no significant difference in maternal attachment between women who conceived with their own eggs and women who conceived with donor eggs. Though women who conceived with their own eggs

had significantly less trait anxiety and higher social support. No research has been reported on the relationship between MFA, FHCL and MHP on Iranian pregnant women via egg donation.

As mentioned in previous chapters, it is important to note that culture impacts on people's attitudes, beliefs and health practices (Ahern & Ruland, 2003), more specifically, culture is an important variable which can affect maternal-fetal attachment procedure and the progress of the maternal role (Mercer, 1986). The insufficient consideration of culture and failure to incorporate cultural differences on studies examining the MFA limits the generalizability of all studies in this context (see e.g., Alhusen, 2008; Righetti, Dell'Avanzo, Grigio & Nicolini, 2005). As argued in chapter 3, there is a considerable social and cultural pressure on Iranian women to conceive and being infertile is seen as generally an unwelcoming event (Hasanpoor-Azghdy, Simbar & Vedadhir, 2015). The reluctance in Iranian culture to conceive by egg donation may have negative effects on women who have conceived by egg donation (see e.g., Abbasi-Shavazi, Nasrabad, Ardekani & Akhondi, 2006; Abbasi-Shavazi, Razeghi-Nasrabad, Behjati Ardekani & Akhondi, 2006; Bagheri-Lankarani, Zarei, Zandi, Omani Samani & Karimi, 2016; Baluch, Fallone, Anderson & Furnham, 1994; Inhorn & Tremayne, 2012; Pir Jalian, 2017).

It is thus important to see if this reluctance to conceive by third party contribution, and the negative public perception for such actions, may have an effect on pregnant women with donor egg conception; particularly on their attachment to the fetus, fetal health locus of control and on their health practices during pregnancy. Thus, the next section will explain the aim of study 2 on maternal bonding via MFA, FHLC and MHP between Iranian pregnant women via egg donation and naturally conceived.

6.8 Study 2 Aims and Hypotheses

There has been no study on Iranian pregnant women through egg donation and comparing them with women who conceived naturally. Indeed, in view of strong religious beliefs of the Iranian women, and the fact that they attribute most of what happens to them as an act of God and with regards to the public perception of children born by egg donation, it would be of great interest to examine the relationship between maternal attachments, health locus of control and health behaviours of Iranian women with a naturally conceived child and those who conceived a child by donor egg.

Therefore, the aim of this study was to examine maternal bonding to the fetus, health beliefs and health practices using MFA, FHLC and MHP amongst Iranian women pregnant via egg donation and naturally.

6.8.1 Research Hypotheses

Null hypothesis 1- there will be no significant difference between Iranian pregnant women via egg donation and naturally on their emotional attachment to their fetus during pregnancy. The answer to this is determined by using all 5 subscales of MFA scale.

Alternative hypothesis 1- there will be a significant difference between Iranian pregnant women via egg donation and naturally on their emotional attachment to their fetus during pregnancy as measured by all 5 subscales of MFA scale.

However, as this measure has 5 subscales (Role taking, Attributing characteristics to the fetus, Giving of self, Differentiation of self from the fetus and Interaction with the fetus) each subscale will be looked at separately when data is analysed.

Null hypothesis 2- there will be no significant difference between Iranian pregnant women via egg donation and naturally on their perception of factors responsible for the health of their unborn baby during pregnancy. The answer to this is determined by using the 3 subscales of FHLC scale.

Alternative hypothesis 2- there will be a significant difference between Iranian pregnant women via egg donation and naturally on their perception of factors responsible for the health of their unborn baby during pregnancy as measured by all 3 subscales of FHLC scale.

However, as this measure has 3 subscales (Internal, Chance and Powerful Others) each subscale will be looked at separately when data is analysed.

Null hypothesis 3- there will be no significant difference between Iranian pregnant women via egg donation and naturally on their health practices during pregnancy. The answer to this is determined by using the MHP scale.

Alternative hypothesis 3- there will be a significant difference between Iranian pregnant women via egg donation and naturally on their health practices during pregnancy as measured by MHP scale.

6.9 Methodology

6.9.1 Research Design

A quasi-experimental research design conducted with mode of conception (natural and egg donation) as a key independent variable and the responses to the 3 questionnaires as the dependent variables, which include MFA, FHLC and MHP.

6.9.2 Participants

The sample group comprised of 21 Iranian women pregnant via egg donation recruited from a hospital in Tehran (Mean Age = 32.42, SD = 4.48) and 50 naturally conceived (Mean Age = 28.06, SD = 5.45). The selection of participants began according to purposeful sampling and continued until data saturation.

The donor egg pregnant women were all in their trimester 1 (from week 1 to the end of week 12) and early stage of their pregnancy. Furthermore, this was their first pregnancy. This is the stage that one is likely to see participants willing to take part in the study. The reason was that firstly, some donor pregnant women soon after conception, and some after delivery of their baby, decided to either change to a different clinic or even leave their hometown to another town or city (personal communications with the gynaecologists). When asked what was the reason for such sudden changes of heart the answer was secrecy. The fact is that they would like to raise their child as their own and not in a context in which, the method of their conception may be known to people/public. Secondly, to overload women at these crucial stages of their life with multiple questionnaires was not possible practically and ethically.

All participants were married and Muslim. Of the 21 mothers with donor egg pregnancies 8 (38.1%) had a university education and 3 (14.3%) were employed. Of the 50 mothers with a natural pregnancy 11 (22%) had a university education and 5 (10%) were employed.

See tables 6.1 and 6.2 for pregnancy in weeks/number of women of donor and natural pregnancy below:

Table 6. 1: Pregnancy in weeks/number of donor egg pregnant women

Pregnancy in weeks	Number of women
2	1
3	2
4	2
5	6
6	2
7	2
8	2
10	1
12	3
Total	21

Table 6. 2: Pregnancy in weeks/number of naturally pregnant women

Pregnancy in weeks	Number of women
2	6
3	2
4	8
5	6
6	4
8	6
9	7
10	5
12	6
Total	50

6.9.3 Measurement

6.9.3.1 Socio-demographic Information

This part of the questionnaire comprised of questions about the pregnant women's socio-demographic characteristics of age, education, profession, having children and mode of conception (via egg donation and natural).

6.9.3.2 Three Self-report Standard Questionnaires and the Rationale for the selection of questionnaires

The researcher accomplished back translation of three standardized self-report instruments into Persian, which comprise: a) Maternal-Fetal Attachment Scale (MFAS) (Cranley, 1981), b) Fetal Health Locus of Control Scale (FHLCS) (Labs & Wurtele, 1986) and c) Health Practices in Pregnancy Questionnaire-II (HPQ-II) (Lindgren, 2005).

The three questionnaires Cranley (MFAS, 1981), Labs and Wurtele (FHLCS, 1986) and Lindgren (MHP or HPQ-II, 2005) were chosen because they are specifically used during pregnancy time assessing the mother fetus bonding, health beliefs and practices. These questionnaires have been used in different cultures, in clinical and research contexts and there is a good indication of reliability and validity (see e.g., Ashford & Rayens, 2015; Busonera, Cataudella, Lampis, Tommasi & Zavattini, 2016; Lingeswaran & Bindu, 2012; Özcan & Duyan, 2015). However, one issue to note is that there is no specific indication at which trimester they should be applied. To the best of the author's knowledge no specific questionnaire was developed to address the

first trimester. It would be a useful follow up research to develop and validate a questionnaire specifically for each trimester.

6.9.3.2.1 Maternal-Fetal Attachment Scale (MFAS)

Maternal-Fetal Attachment Scale (MFAS) is 24-item Likert scale with five subscales: Role taking (acceptance of maternal role, 4 items), Giving of self (5 items), Interaction with the fetus (5 items), Attributing characteristics to the fetus (6 items) and Differentiation of self from the fetus (4 items).

The scale ranges from 1 to 5 with Definitely no, No, Uncertain, Yes to Definitely yes which indicate that the higher the score the more attachment toward the fetus. The items regarding “Role taking” such as “I picture myself feeding the baby”, regarding “Giving of self” such as “I eat meat and vegetables to be sure my baby gets a good diet”, regarding “Interaction with the fetus” such as “I talk to my unborn baby”, regarding “Attributing characteristics to the fetus” such as “I wonder if the baby can hear inside of me”, and regarding “Differentiation of self from the fetus” such as “I have decided on a name for a girl baby”.

The total score ranges from 24-120 with higher scores indicative of higher levels of MFA or attachment. Item 22 “ My body is ugly” was reversed. According to Cranley (1981), early estimates for internal consistency using Cronbach's alpha ranged from 0.52 - 0.73 for the subscales and 0.83 for the entire scale. For the present study, this is a modified and back translation into Persian by the researcher. The modification was in view of taking into account Iranian culture and norms (see Appendix A for the full questionnaire).

6.9.3.2.2 Fetal Health Locus of Control Scale (FHLCS)

The Fetal Health Locus of Control Scale (FHLCS) is designed to determine the way in which pregnant women view various health issues concerning pregnancy (women's views of control over fetal health). The scale comprises of three dimensions, which measures an Internal factor of women's beliefs about their own responsibility for the health of the unborn child (FHLC-I) for example, "What I do right up to the time that my baby is born can affect my baby's health", Chance factors (FHLC-C) for example, "Fate determines the health of my unborn child", and the role of health professionals or Powerful Others (FHLC-P) for example, "My baby's health is in the hands of health professionals" (Labs & Wurtele, 1986).

Responses to each question are made on a nine-point Likert scale and scores on each dimension may range from 0-54, with higher scores demonstrating stronger belief in the particular locus of control. Using a sample of introductory psychology students, Labs and Wurtele found test-retest reliabilities over a two-week interval of 0.80 for the FHLC-I, 0.86 for the FHLC-C and 0.67 for the FHLC-P. Using the same sample, Cronbach's alpha coefficients were 0.88 for the FHLC-I, 0.83 for the FHLC-C and 0.76 for the FHLC-P. For the present study, this is a modified and back translation into Persian by the researcher. The modification was in view of taking into account Iranian culture and norms (see Appendix A for the full questionnaire).

6.9.3.2.3 Health Practices in Pregnancy Questionnaire-II (HPQ-II)

Health Practices in Pregnancy Questionnaire-II (HPQ-II) developed by Lindgren (2005). It is a 35-item self-report questionnaire used to measure health practices important to pregnancy outcomes in six areas: Balance of rest and exercise, Safety

measures, Nutrition, Avoiding the use of harmful substances, Obtaining health care, and Obtaining information. Responses range from 1 (Never) to 5 (Always or Daily) or a word or phrase that indicates the woman's level of engagement in a specific activity. The HPQ-II responses are arranged on a one (lowest) to five (highest) Likert scale with a total score range from 35-175 with a high score indicating a higher quality of health practices. The instrument HPQ-II has demonstrated a Cronbach's alpha reliability of 0.81 and appears to be a valid and reliable measure of pregnant women's health practices (Lindgren, 2005). For the present study, this is a modified 27 items, with 8 items removed from the questionnaire due to cultural differences and back translation into Persian by the researcher. Therefore, responses are with a total score range from 27-135 with a high score indicating a higher quality of health practices. In this modified version negatively worded items were reverse coded (items 5, 8, 16, 18). Examples of reversed items include "Since becoming pregnant I drink more than two caffeinated beverages in a day" and or "Since becoming pregnant I have smoked cigarettes". The modification was in view of taking into account Iranian culture and norms (see Appendix A for the full questionnaire).

6.9.4 Data Collection Procedure and Ethical Approval

Ethical approval for this study was sought from a hospital in Tehran and from Middlesex University ethics committee. The Persian version of the questionnaires was given to the participants by the author during their routine gynaecology visits to the hospital. Confidentiality of the results was assured to all participants. The questionnaires were administered by the author to women on a one to one basis following their consent to take part in the study. The process of data collection initiated in January 2018 and concluded in May 2018.

6.10 Results of Study 2

In general, the results showed women who conceived via donor egg compared to women who conceived naturally scored lower on the four subscales of MFA, namely Attributing characteristics to the fetus, Giving of self, Differentiation of self from the fetus and Interaction with the fetus. On the FHLC scale, they considered both Chance and Professional factors being more responsible for the health of their unborn baby rather than Internal factors (or themselves) and scored lower on MHP indicating they paid significantly less attention to their health activities during pregnancy.

Before formal statistical analysis was conducted on the data the fact that mothers who have conceived by donor egg are on average four years older than naturally conceived mothers which had to be taken into account. Indeed, an independent group T-test confirmed that the difference was statistically significant with $t(69) = 3.23, p = 0.002$. Thus, in the follow-up analysis age was used as a Covariate. The results of statistical analysis of the three standard questionnaires are as follows:

6.10.1 Maternal-Fetal Attachment Scale

To examine hypothesis 1 explained earlier, a 2 participants by 5 subscales (Role-taking, Giving of self, Differentiation, Attribution and Interaction) Mixed Factorial ANOVA using age as a Covariate was conducted on the data. The results showed significant differences between the two groups of pregnant women by egg donation and by natural in 4 dimensions of MFA scale: Giving of self, Differentiation, Attribution and Interaction.

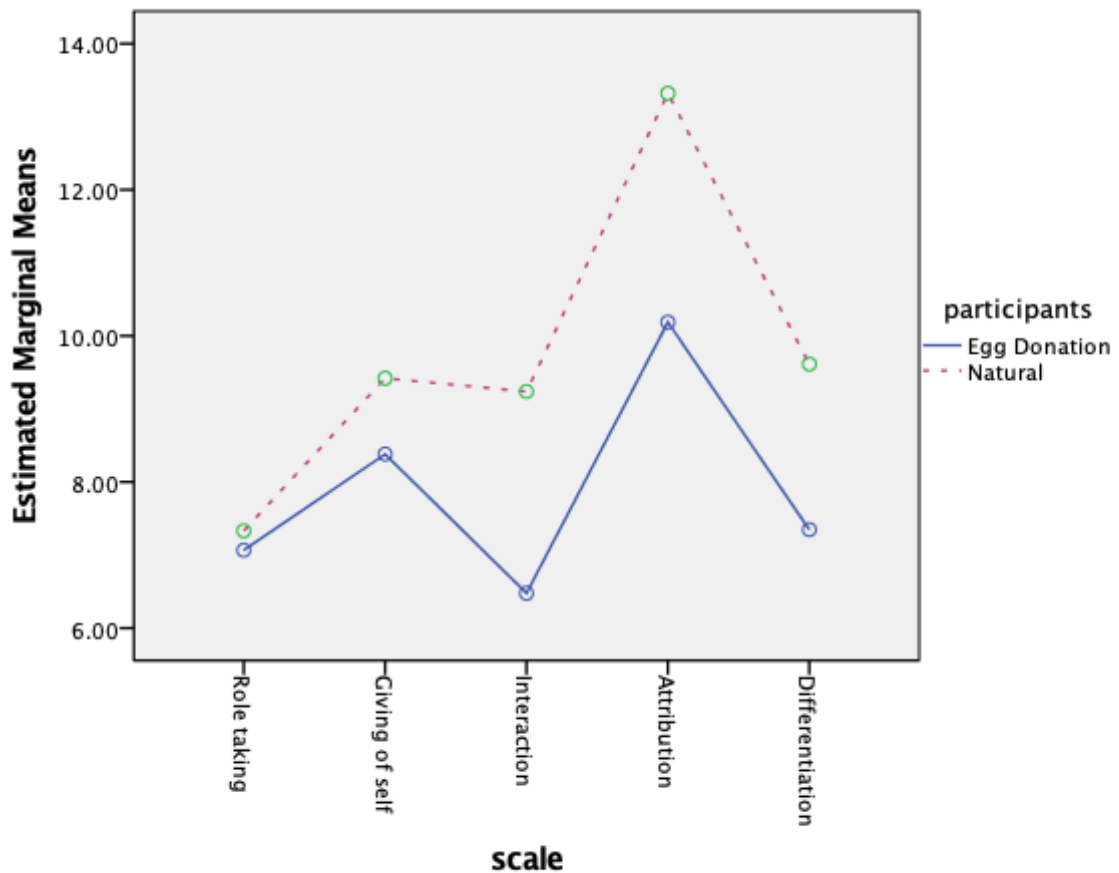
Formal analysis of the data showed a significant main effect for participants with $F(1, 68) = 14.9$, $MSE = 230.17$, $p < 0.0001$, $\eta_p^2 = 0.18$. Using Bonferroni corrections the new alpha was adopted at 0.01 and 5 post hoc independent groups T-tests were conducted. The results showed: For Role taking $t(69) = 1.15$, $p = 0.25$, for Giving of self $t(69) = 2.36$, $p = 0.02$, for Differentiation $t(69) = 4.73$, $p < 0.0001$, for Attribution $t(69) = 4.49$, $p < 0.0001$, and for Interaction $t(69) = 3.58$, $p < 0.0001$. See table 6.3 for the Mean, Standard Deviation for the 5 MFA subscales below:

Table 6. 3: Descriptive Statistics (Mean, Standard Deviation and Number of participants per each condition) of MFAS for Iranian women pregnant via egg donation and naturally

MFA/Subscales	Participants	Mean	SD	N
Role taking	Egg donation	6.76	2.14	21
	Natural	7.46	2.40	50
Giving of self	Egg donation	8.14	1.95	21
	Natural	9.52	2.34	50
Interaction	Egg donation	7.28	2.10	21
	Natural	9.64	2.67	50
Attribution	Egg donation	9.76	2.66	21
	Natural	13.50	3.38	50
Differentiation	Egg donation	6.57	1.96	21
	Natural	9.20	2.20	50

As can be seen in the above table excepting Role taking those who have conceived by donor egg scored lower on “Giving of self” (self-devotion) than naturally pregnant

indicating that they pay less attention to healthy eating, abstaining from harmful substances, less positive attitudes towards the fetus and therefore, are not ready to form a pleasant communication with their babies after delivery. They scored lower than naturally pregnant mothers on “Interaction with the fetus” indicating less talking and communicating to the unborn baby. Also, those who have conceived by donor egg scored lower on “Attributing characteristics to the fetus” than naturally conceived mothers, indicating that they pay less attention to the fetus movement, kicking and features such as thinking, feeling or eating time to their unborn baby. They also scored lower on the subscale of “Differentiation of self from the fetus” demonstrating that they have less inclination for example, to decide on a name for the baby or to look forward to seeing what the baby looks like. See figure below for the 5 MFA subscales (Role taking, Giving of self, Interaction with the fetus, Attributing characteristics to the fetus and Differentiation of self from the fetus) in donor egg and naturally pregnant women:



Covariates appearing in the model are evaluated at the following values: Age = 29.3521

Figure 6. 1: A graphic display of the 5 MFA subscales (Role taking, Giving of self, Interaction with the fetus, Attributing characteristics to the fetus and Differentiation of self from the fetus) and participants

6.10.2 Fetal Health Locus of Control Scale

To examine hypothesis 2 explained earlier, a 2 Participants by 3 subscales (Internal, Chance, Powerful Others/Professionals) Mixed Factorial ANOVA using age as a Covariate was conducted on the data.

Formal analysis of the data showed significant main effect for Participants with $F(1, 68) = 4.13$, $MSE = 10.82$, $p = 0.04$, $\eta_p^2 = 0.05$. Using Bonferroni corrections the new alpha was adopted at 0.01 and 3 post hoc independent groups T-tests was conducted. There was a significant difference for Chance with $t(69) = 3.74$, $p < 0.0001$ and for Internal with $t(69) = 10.54$, $p < 0.0001$, there was however, no significant difference for Powerful Others with $t(69) = 1.42$, $p = 0.15$. See table 6.4 for the Mean, Standard Deviation for the 3 FHLC subscales below:

Table 6. 4: Descriptive Statistics (Mean, Standard Deviation and Number of participants per each condition) of FHLCs between Iranian women pregnant via egg donation and naturally

FHLC/Subscales	Participants	Mean	SD	N
Mean Internal	Egg donation	5.30	1.15	21
	Natural	7.89	0.84	50
Mean Chance	Egg donation	7.65	1.11	21
	Natural	6.59	1.07	50
Mean Professionals	Egg donation	8.03	1.00	21
	Natural	7.76	1.33	50

As can be seen in the above table those who have been conceived by donor egg scored lower on internal health locus of control than natural pregnancy indicating that they have less positive views to their own internal actions responsible for their unborn baby's health. Also, their scores on chance and professionals/powerful others are higher than naturally conceived mothers which indicates that external factors are more important than internal responsible for the health of their unborn baby. See figure

below for the 3 FHLC subscales (Internal, Chance, Powerful Others) of women with egg donation and natural pregnancy:

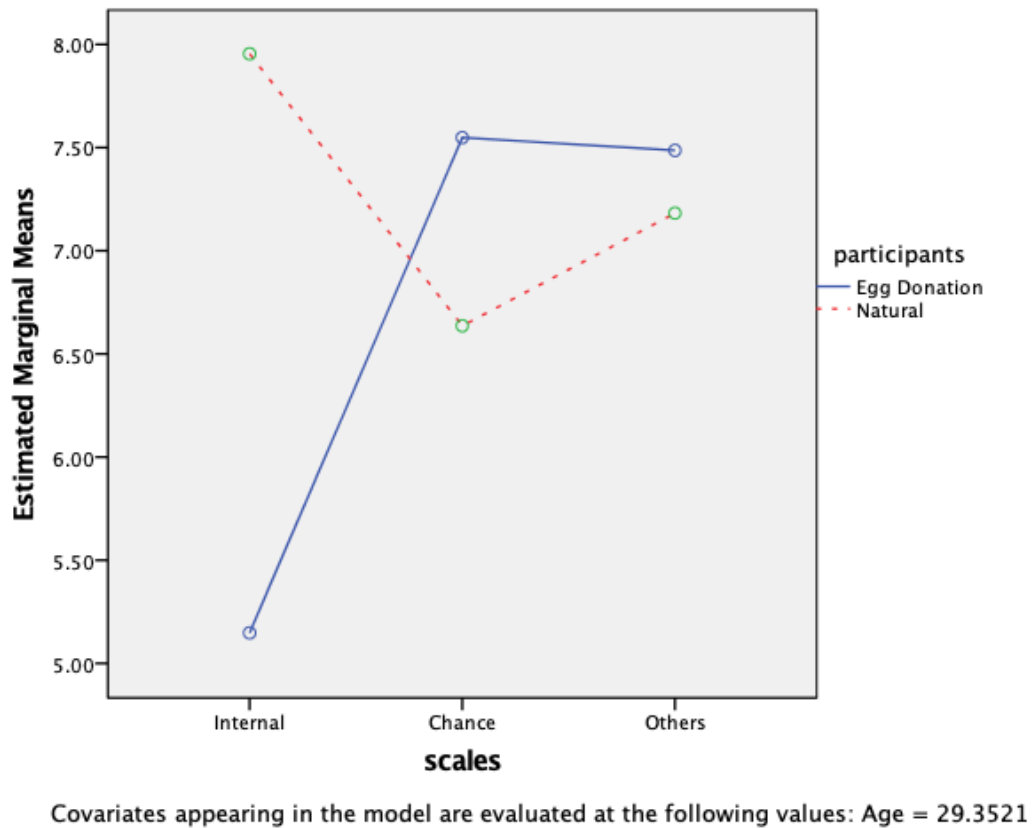


Figure 6. 2: A graphic display of the 3 FHLC subscales (Internal, Chance, Powerful Others) and participants

6.10.3 Health Practices in Pregnancy Questionnaire-II (HPQ-II)

To examine hypothesis 3 explained earlier, an independent group T-test was conducted between mothers who have conceived via donor egg and naturally for

MHP data. See table 6.5 and figure 6.3 for the Mean, Standard Deviation of MHP between Iranian women pregnant via egg donation and naturally below:

Table 6. 5: Descriptive Statistics (Mean, Standard Deviation and Number of participants per each condition) of MHP between Iranian women pregnant via egg donation and naturally

MHP	Participants	Mean	SD	N
MHP	Egg donation	80.85	12.41	21
	Natural	89.62	8.13	50

As can be seen in the above table those who had conceived by donor egg scored lower on maternal health practices compared to naturally conceived pregnancy indicating that they paid less attention to their health activities during their pregnancy which affects their health and the health of their unborn baby.

Formal analysis of the data using Independent groups T-test showed a significant difference between donor egg and natural pregnancy with $t(69) = 3,52, p = 0.001$. See Bar chart below for the Mean scores of MHP of mothers who have conceived via donor egg and naturally:

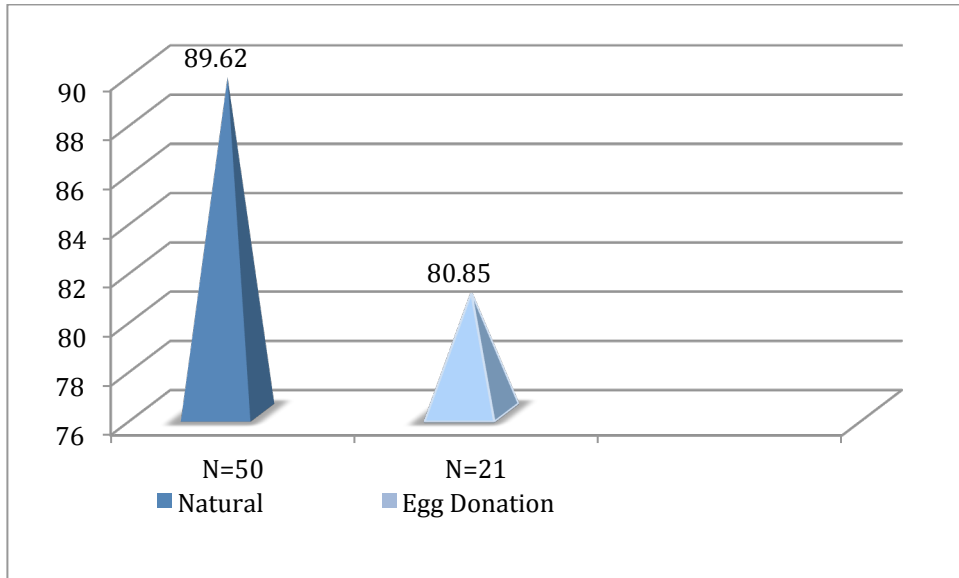


Figure 6. 3: A Bar chart display of Mean scores for MHP of donor egg and naturally pregnant mothers

6.10.4 Correlation Between MFAS, FHLCS and MHP

See table 6.6 for Pearson Correlation Coefficient between total MFA, FHLC (Internal, Chance, Powerful Others) and MHP by 71 participants below:

Table 6. 6: Pearson Correlation Coefficient between Total MFA, FHLC (Internal, Chance, Powerful Others) and MHP by 71 participants

		Total MFA	Internal	Chance	Powerful Others	MHP
Total MFA	Pearson Correlation	1	.312	-.296	-.283	.020
	Sig. (2-tailed)		.008	.012	.017	.870
	N		71	71	71	71
Internal	Pearson Correlation		1	-.344	-.011	.513
	Sig. (2-tailed)			.003	.927	.000
	N			71	71	71
Chance	Pearson Correlation			1	.578	-.431
	Sig. (2-tailed)				.000	.000
	N				71	71
Powerful Others	Pearson Correlation				1	-.310
	Sig. (2-tailed)					.009
	N					71
MHP	Pearson Correlation					1
	Sig. (2-tailed)					
	N					

As can be seen there are significant correlations between the three levels of FHLC with the exception of no correlation between internal and powerful others. MHP shows significant relationship with all measures except the relationship with total MFA, $r = 0.02$, $p = 0.87$. Separating the analysis for the two groups of participants, it was found that the 21 women with donor conceived pregnancy showing no significant relationship between total MFA and MHP with $r = -0.025$, $p = 0.91$. However, when data was analysed for the 50 women who naturally conceived the correlation between total MFA and MHP was significant with $r = -0.33$, $p = 0.01$.

6.11 Discussion

The aim of the present study was to assess maternal bonding, health belief and practices using the three standardised questionnaires namely, MFAS, FHLCS and MHP on Iranian women pregnant via egg donation and naturally.

Iranian public perceptions towards conception by egg donation were found to be generally unfavourable (study1), it was thus expected that Iranian pregnant women via egg donation might also feel generally negative of their pregnancy. Therefore, compared to naturally conceived pregnancy (which is strongly desired in Iran) there should be differences in responses to MFAS, FHLCS and MHP.

The results of MFAS showed that indeed Iranian women with donor conceived pregnancy revealed less emotional attachment towards the fetus, when responding with lower scores on items such as “I wonder if the baby can hear inside of me” or “I eat meat and vegetables to be sure my baby gets a good diet” or “I talk to my unborn baby”. On the FHLC questionnaire Iranian women with donor egg conceived pregnancy considered chance as playing a more important role in the health of their fetus and indicated less positive views to their own internal actions as responsible for their unborn baby’s health. On the MHP questionnaire Iranian women with donor conceived pregnancy indicated that they paid significantly less attention to their health activities during pregnancy and scoring lower on items such as “since becoming pregnant, I think I am practicing a healthy lifestyle” compared to naturally conceived.

Finally, the results of correlations between all the measures administered in the present study showed significant relationships between MFA and FHLC for the

combined group of participants. MFA showed only significant correlations for the naturally conceived with MHP but not for the donor conceived pregnancies. The latter finding is rather surprising, as perhaps a significant negative relationship between health practices and MFA was expected for women who conceived via egg donation. However, the results showed a negative significant correlation for women who conceived naturally. This implied that women who conceived naturally, scored lower on health practices and higher on their MFA or vice versa, women who scored higher on health practices have lower scores on MFA. One reason could be that perhaps there are different lifestyles for Iranian women especially those who conceived naturally compared to those who conceived via donated eggs, which could account for the pattern of results. Perhaps follow up interviews with these women may give more indication for the pattern of results.

It is however, difficult to establish if the present results are specific to Iranian women or could be generalised to women particularly in Western societies. To the best of knowledge of the author to this date one study has been reported using similar contrasts with the present study, in which Pelski (2007) reported no significant differences in MFA between women pregnant by donor egg and with their own egg. Also, Stanton and Golombok (1993) using the maternal-fetal attachment scale and McMahon, Ungerer, Beaurepaire, Tennant and Saunders (1997) found no differences between IVF and naturally pregnant women in pregnancy emotional attachment. One possible reason for this discrepancy between the results of the present study and the other research mentioned would be an indication that indeed women's maternal bonding is affected by cultural differences (see e.g., Harwood, Schoelmerich, Schulze & Gonzalez, 1999).

In relation to FHLC and MFA there has been no research comparing donor egg pregnancy with naturally conceived. There are, however, studies comparing IVF women (not with donor egg) and women with high-risk pregnancies compared with naturally conceived. For example, McMahon, Gibson, Leslie, Cohen and Tennant (2003) reported that IVF mothers stated a more external locus of control than naturally control matched mothers (see also Paulson, Haarmann, Salerno & Asmar, 1988; Wurtele, Roberts & Leeper, 1982). However, the results of this research are with IVF pregnancy not donor egg pregnant women.

With regard to MHP, the present study showed that mothers with donor conception had lower scores than naturally conceived on the MHP questionnaire, indicating that they paid significantly less attention to their health activities during pregnancy. One example item for MHP questionnaire “since becoming pregnant, I think I am practicing a healthy lifestyle”. As mentioned earlier, Lindgren (2001) reported that MFA is a significant predictor of health practices during pregnancy. As the present study showed the MFA was lower in mothers who conceived via egg donation rather than naturally, consequently, they had lower health practices as showed by the MHP. However, the correlation was found not to be significant ($r = - 0.025$, $p = 0.91$).

The results in this study are unique in providing evidence that Iranian women with donor conceived pregnancy differ so significantly in their MFA, FHLC and MHP and the issues that call for practitioners for greater intervention at this stage of pregnancy.

Indeed, as reported in chapter 3, research indicated that Iranian women who conceived via donor eggs believe that the Iranian community has yet to accept ART, as in the case of disclosure, infertility stigma, which they have been attributed to, is

transferred to their children as an illegitimate baby. This can create problems for their child in the future (Abbasi Shavazi, Razeghi-Nasrabad, Behjati Ardakani & Akhondi, 2006).

Furthermore, as reported by Ranjbar, Behboodi-Moghadam, Borimnejad, Ghaffari and Akhondi (2015) the reasons for infertile women seeking assisted pregnancy in Iran are fear and uncertainty, escape from stigma and the pursuit to achieve husband satisfaction. Therefore, the results of the present study are no surprise that donor egg pregnant women had lower MFA, believing in external factors and scored lower on MHP questionnaire compared to the naturally pregnant women.

Thus, Iranian couples who resort to gamete donation might do it secretly and continue to struggle personally and emotionally with their actions, leading to unfavourable consequences that might have significantly negative effects for the family, for the women, and for the donor conceived children (Gürtin, Inhorn & Tremayne, 2015). These findings generally highlight the fact that in the Iranian society the concept of having a child by egg donation is still not acceptable. As mentioned in chapter 3 the reasons to have children in infertile women in Iran is due to “abuse”, “marital instability”, “social isolation”, and “loss of self-esteem” (Behboodi-Moghadam, Salsali, Eftekhar-Ardabili, Vaismoradi & Ramezanzadeh, 2013). Particularly, in the case of women with a donor child are unsure about the future of their child and the extent to which the wider society will accept this mode of conception (see e.g., Pir Jalian, 2017; Pir Jalian, 2019).

6.12 Limitations

Firstly, in an ideal world of scientific research one could have not only studied women who had conceived by egg donor and naturally but also with women who had undergone IVF matched for age, cultural differences, socio-economic status and any other factors that could be considered as playing a role in the conclusions drawn. A straightforward answer is that mothers with a child conceived by egg donor (or IVF) are indeed a hard-to-reach population. Furthermore, to agree to take part indeed proved to be an even more daunting process. The issue of secrecy that was noted in study 1 findings seemed to manifest itself in women's reluctance to take part in this study.

Secondly, another issue to note is that women who at the first trimester were recruited, as it is reported that attachment starts when a mother finds out about her pregnancy and this is the real starting point for fetus' dialogue with his/her surrounding world (Honemeyer & Kurjak, 2014). Thus, the first trimester at least for a study on the Iranian population would be the ideal starting point for studying mother infant bonding and health practices. It is of course possible to repeat the measurements at the other trimesters. This would have been another line of research but limitations set by the clinic, as explained before, and the fact that most Iranian women particularly with conceptions via egg donation may not wish to engage in lengthy research prevented administering the questionnaires at different trimesters.

Thirdly, it would have been ideal to have administered many questionnaires (e.g., state trait anxiety) and at different time phases (initial, during and final pregnancy periods). This is because it could be the case that women's bonding to the fetus could

change at different time periods and different levels of stress and anxiety exhibited, namely beginning of pregnancy, half way or towards the end of pregnancy, and especially after the baby is born. Would maternal attachment change in different time phases due to pregnancy? This is a valid question but to overload women at these crucial stages of their life with multiple questionnaires at different time periods was not possible practically and ethically. To give an example of how women felt about their actions it was noted that some donor pregnant women, soon after conception and some after delivery of their baby, decided to either change to a different clinic or even leave their home town to another town or city (personal communications with the gynaecologists). When asked what was the reason for such sudden changes of heart the answer was secrecy. The fact is that they would like to raise their child as their own and not in a context in which the method of their conception may be known to people/public.

6.13 Summary of the Chapter and Conclusion

This chapter highlighted the difference between Iranian women pregnant via egg donation and naturally in terms of maternal-fetal bonding, health practices and beliefs. In general, the results showed women who conceived via donor egg, compared to women who conceived naturally, scored lower on the four subscales of MFA namely, Attributing characteristics to the fetus, Giving of self, Differentiation of self from the fetus and Interaction with the fetus. On the FHLC scale, they considered chance and professional factors as being more responsible for the health of their unborn baby rather than internal factors (or themselves), and scored lower on MHP indicating they paid significantly less attention to their health activities during pregnancy.

The significant finding from this study is that policy-makers, governments, medical bodies and ART providers should more openly acknowledge the strong role that culture plays in accepting and usage of the new technology i.e., ART and especially egg donation. Furthermore, they should provide information in relation to the process and offer counselling as appropriate.

Chapter 7

**General Discussion, Conclusion and Recommendations,
Limitations and Epilogue**

7.1 General Discussion

“Mother or nothing” is how the WHO (2010) captures the agony of being infertile from a universal position. In line with the theme of “motherhood” the present thesis aimed to examine the great desire of conception this time by third party involvement, namely conception by egg donation. The topic is worthy of research from many perspectives. Firstly, whilst considerable research is aimed at perceptions, behaviours and consequences of ART particularly by IVF, not much has been done on ART via third party egg donor involvement. Considering that advances in medical sciences, ART (as explained in chapters 3 and 4) have brought with it many social, ethical and religious issues especially through conception by egg donation which has its own unique complications, ranging from genetic links, disclosure of information, religious beliefs, to social acceptance. Secondly, it is true that scientists have initiated research to see what are the possible psychological and/or medical consequences of a child born by ART and egg donation, but what the public or mothers of children born by egg donation think about such findings is a different line of research.

Thus, the immediate key question that arises is what does the public perceive as the psychological, medical and social consequences of a child born by egg donation? Furthermore, is there a universal agreement or is it specific to each culture? What do mothers who have experienced having a child by egg donor perceive their child’s social, medical and psychological consequences? In line with the public perception and consequences there is also the need to look at behavioural aspects of mothers having a child conceived by egg donation during the time of their pregnancy. Do mothers differ in their maternal attachment, health practices and health beliefs during pregnancy compared to mothers of naturally born? If so, this would bring a host of

issues for practitioners, doctors and society to find ways of tackling any unforeseen problems.

In line with this introduction the aim of study 1 was to assess the research findings on key issues and controversies around children conceived through egg donation from the viewpoint of the general public in two contrasting cultures of Iran and the UK. Furthermore, to compare the public responses in those cultures with mothers with donor egg children.

The results showed that the Iranian mothers with a donor egg child were more in agreement than their British counterparts that conception via egg donation may have medical, psychological and social problems for the resulting children. This was argued to be due to the lack of genetic link and more likely to be unhappier than naturally born, and that they may experience overt prejudice from the society.

Also, Iranians (public) more than the British were in agreement that children conceived via egg donation have more medical, psychological and social problems than naturally born. It seems that the Iranians' views of children born by egg donation are closer to the scientific research findings (as presented in the 12 statements) on these children than the British public. It appears that the Iranians compared to the British have different perceptions of donor egg children perhaps due to cultural differences, collectivist vs. individualist societies (Greif, 1994), religious restrictions and culturally negative attitudes to egg donation.

In line with the latter conclusion, Ebrahimzadeh Zagami et al. (2019) in a qualitative study on infertile Iranian women undergoing egg donation cycles indicated that these

women felt that the resulting child will not be theirs and egg donation would affect their relationships with their husbands. Women commented that they see their role as “only the container or carrier” of the baby. Their worries even extended to comments that “what if their husband ever faced the donor”. They were worried that if their husbands met the donor he would be attracted to the donor and choose the donor as his new or second wife! Therefore, they had bad feelings about conception by egg donation and its consequences and that their role is only a carrier and the future of their action is bleak!

Finally, the content analysis (both the Iranian and British mothers with a donor egg child and the public men and women) of the probe to the statements revealed that whilst the British and Iranians both believe that biological (genetic) factors play an important role in their concerns, on other matters there were some differences. The Iranians believed that psychological and environmental factors, in addition to disclosure to the child and other people, are of more concerns. Thus, it might cause the child physical, psychological and social problems once entered into the society. Whilst the British felt that family relations and lack of disclosure (versus Iranians) are the key factors to be considered.

These results led this thesis to find out if the Iranian concerns about their donor egg children could display themselves in maternal bonding via maternal-fetal attachment, fetal health locus of control and maternal health practices during pregnancy. Hence, study 2.

The aim of study 2 was to examine maternal bonding to the fetus through MFA, FHLC and MHP amongst Iranian women pregnant via egg donation and naturally. In

general, the results showed women who conceived via donor egg, compared to women who conceived naturally, scored lower on the four subscales of MFA namely Interaction with the fetus, Attributing characteristics to the fetus, Giving of self and Differentiation of self from the fetus. On the FHLC scale, they considered both chance and professional factors as being more responsible for the health of their baby rather than internal factors (or themselves) and paid significantly less attention to their health activities on MHP scale.

In previous chapters, under the umbrella of disruptive innovation theory (although not directly developed in the field of medicine and ART), it was maintained that any new developments might come into conflict with public perceptions and existing traditions and norms. The rapid advancements in ART, with its host of controversies particularly with regard to conception via egg donation (as explained in the previous chapters), was found to be a good testing ground of the DIT. In particular, when the participants of studies of this nature represent contrasting cultural norms, ethical and religious beliefs (Iranians and British). Indeed, Iranians with their deeply rooted religious beliefs, cultural norms and traditions was found to differ significantly (as explained at length in chapter 5) from their British counterparts in how they regard various factors related to a child born as a result of donor egg conception. Study 2 results further reinforced the view that Iranian women who are still in their initial stages of their conception via a donor egg seem to differ in their attitudes about their pregnancy compared to Iranian women who have conceived naturally. The difference in attitudes was observed in women with donor egg conception indicating lack of interest in their health practices and believing that everything that happens to them is in the hand of “others”. It seems that even though Iranian women have decided to go

ahead to have a child by egg donation, the old traditions and cultural beliefs may still linger in their minds and affect their actions.

The results and implications of the above two studies, in particular for the Iranian public and women with a child conceived by egg donation, could be summarised in three categories: Perceptions, behaviours and consequences.

Perceptions - In general, the results showed that the Iranians' perception of conception via egg donation is that it may have psychological, social and medical problems for the resulting children due to lack of genetic link. They perceived the child to be unhappier than naturally born and they may experience overt prejudice from the society.

Behaviours - The behaviour of women with a child conceived by egg donation seemed to show a pattern different from natural pregnancies, especially with regard to maternal-fetal attachment and health practices. It was argued that perhaps one reason for this could be the negative perceptions found in study 1 and the fact that conception by egg donation is often the last resort for Iranians (particularly women).

Consequences - The consequences of overall negative perceptions (study 1) and its possible effects on the women who have conceived a child by donor egg (study 2) calls for concern. It is thus for practitioners, researchers and governmental agencies to consider ways to tackle the problem and assist the future of the donor conceived child and his/her family.

7.2 Conclusion and Recommendations

Overall, the results of the two studies should make an original contribution to perceptions and consequences of children born as a result of egg donation. In particular, in a culture such as Iran in which there is a major dilemma, which from one side puts pressure on having children but at the same time, seems to reject the idea of conception with lack of genetic link.

This thesis sets out to explain certain basic contradictions between the results of various researches into the psychological development of children conceived through ART and egg donation. In a field such as this, which is growing so rapidly and is being applied with arguably little regard for the long-term implications, this must be seen as a fundamental gap. It highlights the need for significantly more research.

Culture, and especially the differences between the East and West and developing and developed countries, is now starting to emerge as a major determinant in understanding the growth of psychological wellbeing in such children. The results of this research, as well as identifying general principles, should help to define those which are conditional by their particular culture or origin, and with particular reference to Iran.

The results would enable one to see what are the key discrepancies and similarities of attitudes of the Iranians and the British about donor egg children. For example, is there a difference in attitudes regarding the disclosure to donor egg conceived children about the precise nature of their conception? Or is there a difference between attitudes of the Iranians and the British about the IQ level of donor egg children?

Similarly, is the general attitude of the Iranians and the British, supportive of the latter views as they have been reported from researchers such as Knoester, Helmerhorst, van der Westerlaken, Walther and Veen (2007) and Zhan et al. (2013), or are there differences?

Exposure to various assisted reproductive technologies, including egg donation, is a stressful process, and providing information and emotional support to patients are the most essential care services they require from treatment centres so that they can make the right decision. The results of the present thesis can assist in planning future strategies for meeting the specific needs of infertile patients.

This thesis sets out to examine for the first time public perception on physical, psychological and social aspects of donor egg children in Iran and Britain, and also to study maternal-fetal bonding of Iranian pregnant women via egg donation and naturally. The findings may be taken as evidence that intervention at the early stages might help a stronger maternal-fetal bonding and health practices of women who conceived a child via donor egg (Pir Jalian, 2019). As such it has direct implications for infertile couples, medical practitioners, and sectors of the society dealing with infertility related issues amongst different cultures.

7.3 Limitations – A Final Note

Some of the limitations associated with each study (1 and 2) were reported at the end of each study and therefore will not be reviewed here. However, there are certain limitations that would need readdressing for more clarification and justification for the studies.

The present thesis (study 1) used the sample of mothers with a donor egg child and the public to assess their perceptions towards donor egg conceived childrens' psychological, medical and educational outcomes.

There are, however, limitations with studies of this nature that one has to acknowledge. One such limitation is when presenting participants with sensitive topics for comments people give socially desirable answers. For example, Baluch, Randhawa, Holmes and Duffy (2001) found this to be the case when asking people to comment on organ donation. Peoples' attitudes were positive but when confronted with a donor card to sign they refused. The same could be true about peoples' attitudes towards ART. For example, McMahon, Gibson, Leslie, Cohen, and Tennant (2003) argued that parents who conceive using IVF and egg donation may be inclined to idealize parenthood and under-report negative effects and parenting problems. That being the case, the findings of relatively positive attitudes of Iranian and British mothers who had a donor egg child on the 12 statements might partly reflect socially desirable responses about childrens' psychological adjustment and behaviour.

A second limitation of the present study was the relatively small number of mothers with a donor egg child (study 1). This was unavoidable due to the difficulty in finding

women with a donor egg child to take part in the study. The sample size is also a noticeable limitation when studying Iranian women during pregnancy via donor egg. This was unavoidable due to the sensitive nature of the study and the difficulty of recruitment as a result (study 2).

Future research could be focused more on studying public perception of conception by egg donation with different cultures and different ethnicities with a bigger sample size. Also, considering a sample of IVF pregnant women as a second control group along with natural and donor egg pregnant women to make comparisons with similar samples in Western countries. Another consideration for future research could be comparing maternal bonding in different phases of pregnancy by developing questionnaires specific for each trimester.

7.4 Epilogue

“Today, encouraged by the rapid advances in the field of assisted reproduction that took place in the past four decades, we dare to predict that the field will continue to evolve, and evolve rapidly” (Seli, 2019). This latest view expressed regarding the future of ART, opens a host of possible scientific research to examine perceptions, behaviours and consequences of ART in different cultures and different ethnic groups. This would have the benefit of identifying misconceptions and concerns of the public and those affected by ART, and to channel it to the direction that will affect all involved in a positive manner.

Chapter 8

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Appendices

Appendix A

Questionnaires (Study 1)

The Questionnaire/Statements to Assess Public Perception on Children Born by Egg Donation (Study 1)

The aim of this questionnaire is to assess public perceptions towards children conceived by egg donation. Each statement is followed by a series of possible responses: Strongly agree, Agree, Disagree or Strongly disagree. Read each statement carefully and decide which response best describes how you feel. Then put a tick in the right place. Please respond to every statement. If you are not completely sure which response is more accurate, put the response which you feel is most appropriate. Do not spend too long on each statement. It is important that you answer each question as honestly as possible. If you wish to give a brief explanation regarding your selected response please add it below each statement. All information will be treated with the strictest confidence.

This is a brief explanation for the term used in the questionnaire:

Egg Donation: Is a fertility treatment procedure in which the couple who have not achieved pregnancy by natural means (particularly because of the women's poor egg quality or age) will have to attend the clinic for well over two weeks to undergo a treatment in which a donor's egg is fertilized by the man's sperm in the laboratory. The resulting embryo is then transferred into the recipient and approximately less than half of the cases will result in pregnancy.

Demographic Information: (Study 1)

Age:.....

Sex:.....

Religion:.....

Marital status: Single [] Married [] Divorced [] Separated []

The higher degree you achieved: No formal education [] Diploma []

Foundation degree [] Bachelor's degree [] Master's degree []

Doctoral []

The subject of your highest degree:.....

Occupation:.....

Do you have any children?

Yes [] No []

Have you had any experience of egg donation yourself?

Yes [] No []

Do you know anyone who has had an experience of egg donation?

Yes [] No []

1- Donor egg conceived children have more childhood illnesses than naturally conceived children

Strongly agree [] Agree [] Disagree [] Strongly disagree []

Plases give your reasons.....

2- Children inherit most of their genes from their father

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

3- Donor egg conceived children are more likely to be infertile themselves than naturally conceived children

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

4- Donor egg conceived children with a lack of genetic link with their mother result in psychological adjustment problems

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

5- Donor egg conceived children are generally unhappier than naturally conceived children

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

6- Donor egg conceived children are at higher risk of Autism than naturally conceived children

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

7- Donor egg conceived children have lower self-esteem than naturally conceived children

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

8- Donor egg conceived children should be told about the precise nature of their conception

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

9- Donor egg conceived children have lower IQ scores than naturally conceived children

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

10- Donor egg conceived children are at a greater risk of being expelled from school than naturally conceived children

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

11- Donor egg conceived children might experience overt prejudice from the wider community, relatives and friends

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

12-Teachers should be informed of which children in their class have been born by egg donation

Strongly agree [] Agree [] Disagree [] Strongly Disagree []

Plases give your reasons.....

Back translation of the Questionnaire/Statements to Assess Public perception on Children Born by Egg Donation into Persian (Study 1)

پرسشنامه سنجش ادراک افراد در مورد جنبه های پزشکی روانی و آموزشی کودکان متولد شده از اهدا

تخمک

هدف از این پرسشنامه سنجش ادراک افراد در مورد بچه هایی است که از طریق اهدا تخمک بدنیا آمده اند.

هر پرسش توسط یک سری از پاسخ های ممکن دنبال میشود: کاملاً موافق، موافق، مخالف یا کاملاً مخالف.

هر پرسش را با دقت بخوانید و تصمیم بگیرید که کدام پاسخ بهتر احساس شما را توضیح می دهد. سپس پاسخ مربوطه را در جای مناسب علامت بزنید. لطفاً به هر پرسش پاسخ دهید. اگر شما به طور کامل مطمئن نیستید که کدام پاسخ دقیق تر است، پاسخی را انتخاب کنید که احساس می کنید مناسبتر است. اما بیش از حد لازم در هر پرسش وقت صرف نکنید. این مهم است که شما به هر سوال تا آنجا که امکان پذیر است پاسخ صادقانه دهید. اگر شما مایل هستید توضیحات مختصری در مورد انتخاب پاسختان بدهید لطفاً آن را در زیر هر یک از پاسخها اضافه کنید. همه اطلاعات در این پرسشنامه کاملاً محرمانه خواهد بود.

توضیح مختصری برای اصطلاح استفاده شده در پرسشنامه :

اهدای تخمک :

اهدای تخمک یک روش درمانی برای باروری است که در آن زوجینی که به روشهای طبیعی باردار نشده اند (خصوصاً به دلیل ضعف و سن تخمکها) مجبورند بیش از دو هفته در کلینیک حاضر شوند تا تحت درمان با اهداء تخمک بارور شده توسط اسپرم مرد در آزمایشگاه قرار گیرند.

جنین حاصل به گیرنده (مادر) منتقل می شود و تقریباً کمتر از نیمی از موارد منجر به حاملگی می شود.

Demographic Information in Persian (Study 1)

سن:

جنسیت : مرد [] زن []

دین و مذهب :

وضعیت تاهل : مجرد [] متاهل [] مطلقه [] جدا شده []

تحصیلات: زیر دیپلم [] دیپلم [] دانشجوی [] کارشناسی []

کارشناسی ارشد [] دکتری []

رشته تحصیلی :

شغل :

آیا فرزندی دارید؟ بله [] خیر []

آیا خود شما تجربه اهدا تخمک داشته اید؟ بله [] خیر []

آیا کسی را می شناسید که تجربه اهدا تخمک داشته است : بله [] خیر []

کودکان اهدا تخمک دارای بیماری های دوران کودکی بیشتری در مقایسه با کودکانی هستند که به طور

طبیعی به دنیا آمده اند

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

کودکان اهدا تخمک ، بسیاری از ژن های خود را از پدر خود به ارث می برند

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

کودکان اهدا تخمک در مقایسه با کودکانی که به طور طبیعی به دنیا آمده اند با احتمال بیشتری در آینده

نابارور خواهند بود

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

کودکان اهدا تخمک به طور کلی در مقایسه با کودکانی که به طور طبیعی به دنیا آمده اند خوشحال

نیستند

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

کودکان اهدا تخمک در مقایسه با کودکانی که به طور طبیعی به دنیا آمده اند در معرض خطر بالاتری از

اوتیسم قرار دارند

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

عدم ارتباط ژنتیکی با مادر در کودکان اهدا تخمک موجب مشکلات روانشناختی در آنها خواهد شد

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

کودکان اهدا تخمک در مقایسه با کودکانی که به طور طبیعی به دنیا آمده اند در معرض خطر بیشتر

اخراج از مدرسه می باشند

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

کودکان اهدا تخمک در مقایسه با کودکانی که به طور طبیعی به دنیا آمده اند نمرات بهره هوشی کمتری

دارند

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

کودکان اهدا تخمک در مقایسه با کودکانی که به طور طبیعی به دنیا آمده اند اعتماد به نفس پایین تری

دارند

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

کودکان اهدا تخمک باید در مورد ماهیت دقیق به وجود آمدنشان آگاهی داشته باشند

کاملاً مخالف [] مخالف [] موافق [] کاملاً موافق []

لطفاً دلیل خود را بنویسید.....

کودکان اهدا تخمک ممکن است تجربه تعصب آشکاری از جامعه، بستگان و دوستان داشته باشند

کاملاً مخالف مخالف موافق کاملاً موافق

لطفاً دلیل خود را بنویسید.....

معلمان باید در کلاس خود مطلع باشند کدام کودکان توسط اهدا تخمک متولد شده اند

کاملاً مخالف مخالف موافق کاملاً موافق

لطفاً دلیل خود را بنویسید.....

Participants Comments to Justify their Answers to each Statement

(Study 1)

(Iranian comments have been translated into English)

The letters in front of each comment stand for:

M- Miscellaneous

B/G - Biological/Genetic

E- Environmental

F- Family relationship

P/S- Psychological factors/Stress

D- Disclosure

L- Lack of disclosure

Statement 1: Donor egg conceived children have more childhood illnesses than naturally conceived children

Iranian comments:

- Because physically they are weaker than normal children- M
- Because of the stress during the pregnancy- S
- They face more psychological problems- S
- Because of not having the correct identity- G/B
- These children are not really linked to their mothers due to their genes –G/B
- Donor egg have older mothers thus more prone psychological to illness -S
- If they don't know who is their real mother they get ill - S
- If they don't have a supportive family because they are not part of the family- E
- These children are exactly the same with other children-M
- I know 2 IVF children and they have normal childhood-M
- Because these children are born same as normal ones- M
- Children develop illness because they don't know who their real mother is -E
- It is likely because of assistance to reproduction that makes them more ill-S
- There is no research-M
- Because of mothers concern what the society thinks about their action -E
- Frequent illness during childhood-M

- It is the opposite naturally conceived are healthier -M
- Even naturally children may have illness -M

British comments:

- Frequent illness during childhood due to family relationships - F
- The opposite is true - M
- Even naturally born children may have illness - M

Statement 2: Children inherit most of their genes from their father

Iranian comments:

- It is not proven and they inherit the genes from both parents as normal children - B/G
- In the case of being girls is equal otherwise non-comparable - B/G
- Children inherited with the equal number genes from parents - B/G
- Genetically it is likely children inherit from mother - B/G
- Because of the combination of genes from both parents - B/G
- I feel that and heard of it - M
- Depends on the parents which one is dominant - M
- Because of my experience and observations - M
- Equally from both parents - B/G
- Equally from both parents - B/G
- Equally from both parents - B/G
- From both parents - B/G

British comments:

- Because my son got more genes from his mother - B/G
- 50/50 - B/G
- 50/50 - B/G

Statement 3: Donor egg conceived children are more likely to be infertile themselves than naturally conceived children

Iranian comments:

- I am not sure but it could be psychological - S
- I do not know - M
- Infertility depends on environmental conditions like infections, genetic disorders and etc. - E

- I do not know - M
- Because it is not genetically linked - B
- No information - M
- It can be not like that because of the advanced technology - M
- Environmental factors play a role - E
- It depends on how they are educated and their enjoyment – E
-

British comments:

- Biological factors may play a role - B/G

Statement 4: Donor egg conceived children with a lack of genetic link with their mother result in psychological adjustment problems

Iranian comments:

- I think it is the lack of genetic connection - B/G
- It's like adoptive a child they have psychological problem - P
- In case of non-biological parents it is likely that these children suffer more intensive psychological problems - P
- No idea - M
- No information - M
- If others knows about their past it will affect the child - E
- If it is said to children that you are different the child suffer - E
- Incompatibility - M

British comments:

- Potentially but not always if it is well disclosed - L
- Family relationship plays a role here - F
- Children have the right to know if they are not told it will affect them - D

Statement 5: Donor egg conceived children are generally unhappier than naturally conceived children

Iranian comments:

- I do not believe their mentalities would link to the way they are born
- I do not know – M
- Lack of happiness depends on environmental conditions not the way of conception - E
- The two children that I know are very happy because of supportive parents - E
- Based on my seeing - M
- Depends on their environment - E

- If they know about their past affects their future - B/G
- I have seen children that have psychological problem if they are adopted this is like adoption - B/G
- It depends on environment, education and parents behaviour - E
- Environmental and family are important - E
- They are not happy as I know some that are stressed but they try to have friend and go to party to become happy - P

British comments:

- Only if they learn how they were born - D
- The family plays an important role - F
- There should be special support for the family - F

Statement 6: Donor egg conceived children are at higher risk of Autism than naturally conceived children

Iranian comments:

- Their mentalities does not have link to the way they have been born - M
- I do not know - M
- Autism has genetic aetiology - B/G
- No idea - M
- It is because of environment and conditions - E
- Depends on their family and nutrition - E
- I do not know - M

British comments:

- It's genetically linked - B/G
- I think the opposite is true - M
- Genetics play a role - B/G

Statement 7: Donor egg conceived children have lower self-esteem than naturally conceived children

Iranian comments:

- It is because of the nurture and environmental factors - E
- My experience with these children is that they feel different - p
- Depends on their parents and others behaviours - E
- Society plays a role - E
- Yes more during childhood due to environmental factors - E
- If these children know how they born - D

British comments:

- The family play a role in child's psychological adjustment - F
- The parents play an important role - F

Statement 8: Donor egg conceived children should be told about the precise nature of their conception

Iranian comments:

- After puberty no problem as they could adjust psychologically - P
- Telling the child depends on the effect on child and must be in later life in the society - E
- I feel it important - M
- Negative effect - D
- No reason for doing this - M
- Shouldn't be told - D
- Must be tell them in older age not in childhood as they could cope psychologically - P
- It has negative effect on children - D
- It has negative effect due to public reaction - E
- Negative affect on mentality and personality of children in the future - P
- It is good to know who you are - M
- It is not necessary - D

British comments:

- It's best to be honest as it is the child right to know - L
- There is no reason for them not to know - L
- It will strengthen the bonding with the family rather than keeping secret - F

Statement 9: Donor egg conceived children have lower IQ scores than naturally conceived children

Iranian comments:

- This is because of the genetic transfer - B/G
- Because of what others think of them - E
- I do not know - M
- It is environmental factors - E
- If children knows about their origins - D

British comments:

- There should be scientific research on this topic but the answer may affect family relationships - F

Statement 10: Donor egg conceived children are at a greater risk of being expelled from school than naturally conceived children

Iranian comments:

- No idea - M
- If other children find out it will cause problem - E
- If they have psychological Problems - P
- If they know how they were born - D

British comments:

- It depends on their parents behaviour - F
- Family plays a role - F

Statement 11: Donor egg conceived children might experience overt prejudice from the wider community, relatives and friends

Iranian comments:

- These children are more of interest and attention to others - E
- Because of the time and cost - M
- No idea - M
- If they and people do not know that, not differences - D
- Possibly due to people not knowing much about them - E
- If people know their origins - D

British comments:

- People would not necessary know the child was ART - L
- Not in the UK as families and friends are supportive - F
- People should be open minded and understand - L

Statement 12: Teachers should be informed of which children in their class have been born by egg donation

Iranian comments:

- I believe every body should know - E
- No reason not to know - E
- This is a matter of family and it is not necessary to tell others as it may cause distress - P
- This is not a very private issue - M
- In my view no differences between these children and normal ones - M
- To know how to behave with these children as it may affect them psychologically - P
- No reason not to tell the teachers - M
- Because our society is a traditional and religious country - E
- It is likely that people ignore them - E
- I think these children are normal and their behaviours entirely depends on nurture and not the way they are born - B
- Knowing this is relate to the teacher and education - M
- To know if they behave in the same way or not - M
- In this world which is full of prejudice - E
- No reason not to tell - M

British comments:

- It is not a concern for education - M
- Only if it is proven that ART children have additional problems - M
- It should be with the approval of the child - L
- It's personal matter as it may affect the child at school - L
- Unless it benefits the child - L
- It shouldn't matter - M
- Not relevant to teaching a child - M
- All children should be treated equally - M
- Only with the approval of the family - F

Principle Component Analysis (Study 1)

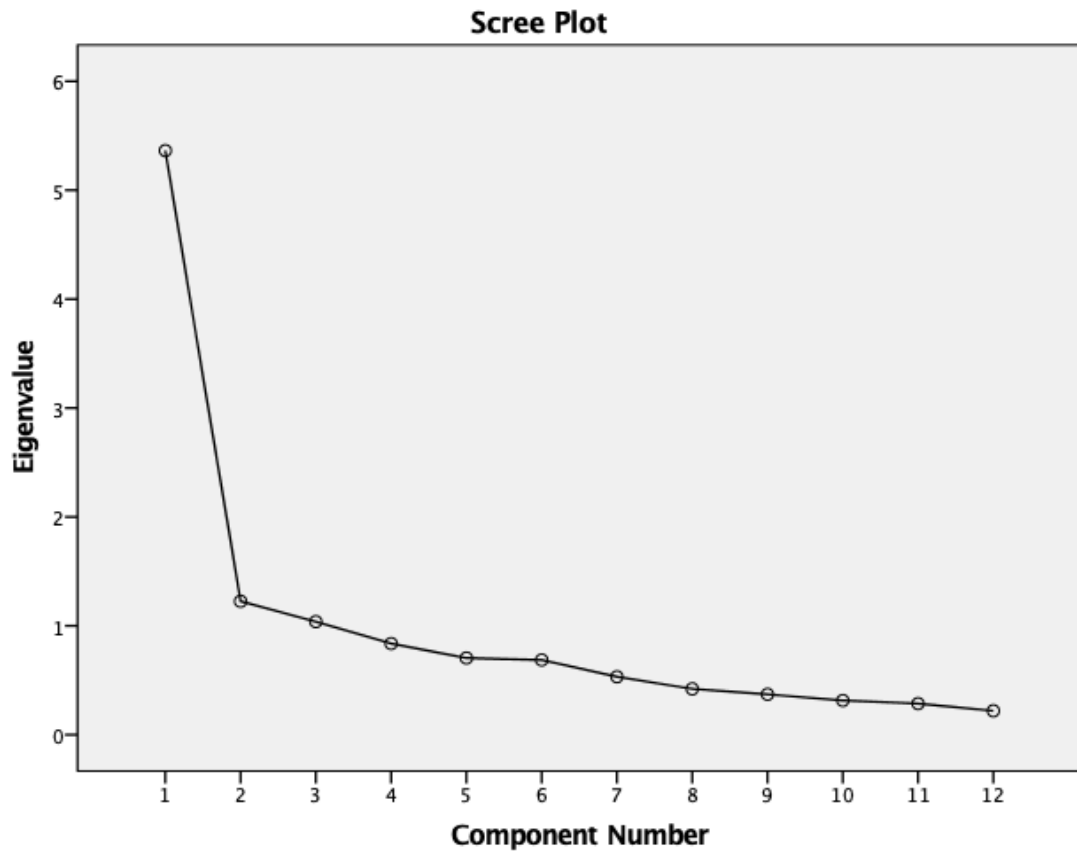
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Adequacy Measure of Sampling	.886
Bartlett's Test of Approx. Chi-Square	583.407
Sphericity df	66
Sig.	.000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.364	44.698	44.698	5.364	44.698	44.698	3.635	30.291	30.291
2	1.226	10.214	54.912	1.226	10.214	54.912	2.593	21.605	51.895
3	1.038	8.649	63.561	1.038	8.649	63.561	1.400	11.665	63.561
4	.837	6.976	70.536						
5	.704	5.870	76.406						
6	.686	5.720	82.126						
7	.532	4.435	86.561						
8	.421	3.508	90.069						
9	.371	3.091	93.159						
10	.315	2.623	95.782						
11	.286	2.385	98.167						
12	.220	1.833	100.000						

Extraction Method: Principal Component Analysis.



Scree plot for the 12 statements

Rotated Component Matrix^a

Component	1	2	3
Children inherit most of their genes from their father	.820		
Donor egg children are more likely to be infertile themselves than naturally children	.731	.260	.159
Donor egg children are at higher risk of Autism than naturally children	.693	.436	.220
Donor egg children have more childhood illnesses than naturally children	.657	.328	
Donor egg children are generally unhappier than naturally children	.612	.496	.188
Donor egg children are at a greater risk of being expelled from school than naturally children	.599	.556	
Donor egg children with a lack of genetic link with their mother result in psychological problems	.486	.254	.316
Donor egg children have lower IQ scores than naturally children	.346	.774	
Donor egg children have lower self-esteem than naturally children	.384	.767	
Donor egg children might experience overt prejudice from the wider community and relatives	-.132	.643	.457
Donor egg children should be told the precise nature of their conception			.820
Teachers should be told which child in their class is born by egg donation	.504		.549

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization^a
 a. Rotation converged in 19 iterations

Questionnaires (Study 2)

Demographic Information (Study 2)

1- What is your age? -----(Years)

2- What is the highest qualification you have achieved?

Illiterate Primary Secondary High school University level

3- What is your job?

Unemployed Employed Student

4- Do you have any children?

Yes No

5- How many children do you have? -----

6- What is your mode of conception?

Egg donation Natural

7- How many weeks pregnant are you? -----(Weeks)

8- Is this your first time pregnancy?

Yes No

Demographic Information in Persian (Study 2)

سؤالات عمومی

مادر عزیز: لطفاً به سؤالات زیر پاسخ دهید.

سن: _____ (به سال)

سطح تحصیلی: بی سواد ابتدایی راهنمایی دبیرستان دانشگاهی

شغل: بیکار شاغل دانشجو

آیا فرزندی دارید؟ بلی خیر

چند فرزند دارید؟ _____

از چه طریقی باردار شده اید؟

طبیعی اهداء تخمک

چند هفتگی بارداری هستید؟ (به هفته) _____

آیا این اولین بارداری شماست؟ بلی خیر

Maternal-Fetal Attachment Scale (Study 2)

1- I talk to my unborn baby.

Definitely Yes Yes Uncertain No Definitely No

2- I feel all the trouble of being pregnant is worth it.

Definitely Yes Yes Uncertain No Definitely No

3- I enjoy watching my tummy jiggle as the baby kicks inside.

Definitely Yes Yes Uncertain No Definitely No

4- I picture myself feeding the baby.

Definitely Yes Yes Uncertain No Definitely No

5- I'm really looking forward to seeing what the baby looks like.

Definitely Yes Yes Uncertain No Definitely No

6- I wonder if the baby feels cramped in there.

Definitely Yes Yes Uncertain No Definitely No

7- I refer to my baby by a nickname.

Definitely Yes Yes Uncertain No Definitely No

8- I imagine myself taking care of the baby.

Definitely Yes Yes Uncertain No Definitely No

9- I can almost guess what my baby's personality will be from the way he/she moves around. Definitely Yes Yes Uncertain No Definitely No

10- I have decided on a name for a girl baby.

Definitely Yes Yes Uncertain No Definitely No

11- I do things to try to stay healthy that I would not do if I were not pregnant.

Definitely Yes Yes Uncertain No Definitely No

12- I wonder if the baby can hear inside of me.

Definitely Yes Yes Uncertain No Definitely No

13- I have decided on a name for a boy baby.

Definitely Yes Yes Uncertain No Definitely No

14- I wonder if the baby thinks and feels “things” inside of me.

Definitely Yes Yes Uncertain No Definitely No

15- I eat meat & vegetables to be sure my baby gets a good diet.

Definitely Yes Yes Uncertain No Definitely No

16- It seems my baby kicks and moves to tell me it’s eating time.

Definitely Yes Yes Uncertain No Definitely No

17- I poke my baby to get him/her to poke back.

Definitely Yes Yes Uncertain No Definitely No

18- I can hardly wait to hold the baby.

Definitely Yes Yes Uncertain No Definitely No

19- I try to picture what the baby will look like.

Definitely Yes Yes Uncertain No Definitely No

20- I stroke my tummy to quieten the baby when there is too much kicking.

Definitely Yes Yes Uncertain No Definitely No

21- I can tell that the baby has hiccups.

Definitely Yes Yes Uncertain No Definitely No

22- I feel my body is ugly.

Definitely Yes Yes Uncertain No Definitely No

23- I give up doing certain things because I want to help my baby.

Definitely Yes Yes Uncertain No Definitely No

24- I grasp my baby’s foot through my tummy to move it around.

Definitely Yes Yes Uncertain No Definitely No

Maternal-Fetal Attachment Subscales

Role Taking

- 4- I picture myself feeding the baby.
- 8- I imagine myself taking care of the baby.
- 18- I can hardly wait to hold the baby.
- 19- I try to picture what the baby will look like.

Differentiation of Self from the Fetus

- 3- I enjoy watching my tummy jiggle as the baby kicks inside.
- 5- I'm really looking forward to seeing what the baby looks like.
- 10- I have decided on a name for a girl baby.
- 13- I have decided on a name for a boy baby.

Interaction with the Fetus

- 1- I talk to my unborn baby.
- 7- I refer to my baby by a nickname.
- 17- I poke my baby to get him/her to poke back.
- 20- I stroke my tummy to quieten the baby when there is too much kicking.
- 24- I grasp my baby's foot through my tummy to move it around.

Attributing Characteristics to the Fetus

- 6- I wonder if the baby feels cramped in there.
- 9- I can almost guess what my baby's personality will be from the way he/she moves around.
- 12- I wonder if the baby can hear inside of me.
- 14- I wonder if the baby thinks and feels "things" inside of me.
- 16- It seems my baby kicks and moves to tell me it's eating time.
- 21- I can tell that my baby has the hiccups.

Giving of Self

- 2- I feel all the trouble of being pregnant is worth it.
- 11- I do things to try to stay healthy that I would not do if I were not pregnant.
- 15- I eat meat and vegetables to be sure my baby gets a good diet.
- 22- I feel my body is ugly.
- 23- I give up doing certain things because I want to help my baby.

Back translation of Maternal-Fetal Attachment Scale into Persian (Study 2)

پرسشنامه دلبستگی مادر جنین

مادر عزیز: لطفاً به سوالات زیر در رابطه با خودتان و کودکی که منتظرش هستید پاسخ دهید، پاسخ درست یا غلط وجود ندارد.

اولین انتخاب شما معمولاً بهترین انعکاس از احساساتتان می باشد. در نظر داشته باشید برای هر جمله فقط یک پاسخ را علامت بزنید.

من به موارد زیر فکر یا عمل می کنم:

شماره	قطعاً بلی	بلی	نامطمئن	خیر	قطعاً خیر
۱					با بچه داخل شکمم حرف می زنم
۲					احساس می کنم بارداری ارزش همه دردسرهایی که در طی آن ایجاد می شود دارد
۳					من از دیدن شکمم که بچه از داخل لگد میزند لذت می برم
۴					خود را در حال شیر دادن به بچه مجسم می کنم
۵					انتظار می کشم که ببینم بچه ام چه شکلی است
۶					نمی دانم آیا بچه ام داخل شکمم احساس فشار می کند یا نه
۷					با لقب مثل کوچولو، وروجک و ... در باره اش حرف می زنم
۸					تصور می کنم که دارم از بچه ام مراقبت می کنم
۹					از حرکات بچه ام می توانم به خوبی حدس بزنم که شخصیتش چگونه خواهد بود
۱۰					برای یک نوزاد دختر اسمی انتخاب کرده ام
۱۱					برای سالم ماندن کارهایی انجام میدهم که اگر باردار نبودم انجام نمی دادم
۱۲					نمی دانم آیا بچه ام داخل شکمم می تواند بشنود یا نه
۱۳					برای یک نوزاد پسر اسمی انتخاب کرده ام

- ۱۴ نمی دانم بچه ام داخل شکمم می تواند فکر کند و چیزهایی
را احساس کند یا نه
- ۱۵ گوشت و میوه جات می خورم تا مطمئن باشم که بچه ام
غذای خوبی دریافت می کند
- ۱۶ به نظر می رسد بچه ام لگد میزند و حرکت می کند تا به
من بگوید وقت غذاست
- ۱۷ با نوک انگشت شکمم را به داخل فشار می دهم تا او هم
جواب دهد
- ۱۸ چشم انتظار تولد بچه بودن برآیم سخت است
- ۱۹ سعی می کنم مجسم کنم بچه ام چه شکلی خواهد بود
- ۲۰ موقعی که بچه زیاد لگد میزند روی شکمم دست می کشم تا
او را آرام کنم
- ۲۱ می توانم بگویم که بچه ام صداهایی در می آورد
- ۲۲ احساس می کنم بدنم زشت شده است
- ۲۳ انجام بعضی کارها را کنار گذاشته ام به خاطر اینکه می
خواهم به بچه ام کمک کنم
- ۲۴ از روی شکمم پاهای بچه ام را لمس می کنم تا آنرا به
اطراف تکان دهد

Fetal Health Locus of Control Scale (Study 2)

The following items are designed to determine the way in which you view various health issues concerning pregnancy. Each item is a belief statement with which you can either agree or disagree. Beside each statement is a scale that ranges from Strongly Disagree (0) to Strongly Agree (9). For each item, we would like you to circle the number that best represents the extent to which you agree or disagree with the statement. The more strongly you agree with a statement, the higher will be the number you circle. The more strongly you disagree with a statement the lower will be the number you circle. Please be sure that you answer every item and that you circle only one number per item.

Strongly disagree Slightly disagree Slightly agree Strongly agree

0 1 2 3 4 5 6 7 8 9

1- By attending prenatal classes taught by competent health professionals, I can greatly increase the odds of having a healthy, normal baby.

0 1 2 3 4 5 6 7 8 9

2- Even if I take excellent care of myself when I am pregnant, fate will determine whether my child will be normal or abnormal.

0 1 2 3 4 5 6 7 8 9

3- My baby will be born healthy only if I do everything my doctor tells me to do during pregnancy.

0 1 2 3 4 5 6 7 8 9

4- If my baby is born unhealthy or abnormal, nature intended it to be that way.

0 1 2 3 4 5 6 7 8 9

5- The care I receive from health professionals is what is responsible for the health of my unborn baby.

0 1 2 3 4 5 6 7 8 9

6- My unborn child's health can be seriously affected by my dietary intake during pregnancy.

0 1 2 3 4 5 6 7 8 9

7- Health professionals are responsible for the health of my unborn child.

0 1 2 3 4 5 6 7 8 9

8- If I get sick during pregnancy, consulting my doctor is the best thing I can do to protect the health of my unborn child.

0 1 2 3 4 5 6 7 8 9

9- No matter what I do when I am pregnant, the laws of nature will determine whether or not my child will be normal.

0 1 2 3 4 5 6 7 8 9

10- Doctors and nurses are the only ones who are competent to give me advice concerning my behaviour during pregnancy.

0 1 2 3 4 5 6 7 8 9

11- God will determine the health of my child.

0 1 2 3 4 5 6 7 8 9

12- Learning how to care for myself before I become pregnant helps my child to be born healthy.

0 1 2 3 4 5 6 7 8 9

13- My baby's health is in the hands of health professionals.

0 1 2 3 4 5 6 7 8 9

14- Fate determines the health of my unborn child.

0 1 2 3 4 5 6 7 8 9

15- What I do right up to the time that my baby is born can affect my baby's health

0 1 2 3 4 5 6 7 8 9

16- Having a miscarriage means to me that my baby was not destined to live.

0 1 2 3 4 5 6 7 8 9

17- Before becoming pregnant, I would learn what specific things I should do and not do during the pregnancy in order to have a healthy, normal baby.

0 1 2 3 4 5 6 7 8 9

18- Only qualified health professionals can tell me what I should and should not do when I am pregnant.

0 1 2 3 4 5 6 7 8 9

Fetal Health Locus of Control Subscales (Internal, Chance and Powerful Others/Professionals) (6 Items in each Subscale)

Internal

- 1- By attending prenatal classes taught by competent health professionals, I can greatly increase the odds of having a healthy, normal baby.
- 6- My unborn child's health can be seriously affected by my dietary intake during pregnancy.
- 8- If I get sick during pregnancy, consulting my doctor is the best thing I can do to protect the health of my unborn child.
- 12- Learning how to care for myself before I become pregnant helps my child to be born healthy.
- 15- What I do right up to the time that my baby is born can affect my baby's health
- 17- Before becoming pregnant, I would learn what specific things I should do and not do during the pregnancy in order to have a healthy, normal baby.

Chance

- 2- Even if I take excellent care of myself when I am pregnant, fate will determine whether my child will be normal or abnormal.
- 4- If my baby is born unhealthy or abnormal, nature intended it to be that way.
- 9- No matter what I do when I am pregnant, the laws of nature will determine whether or not my child will be normal.
- 11- God will determine the health of my child.
- 14- Fate determines the health of my unborn child.
- 16- Having a miscarriage means to me that my baby was not destined to live.

Powerful Others/Professionals

3- My baby will be born healthy only if I do everything my doctor tells me to do during pregnancy.

5- The care I receive from health professionals is what is responsible for the health of my unborn baby.

7- Health professionals are responsible for the health of my unborn child.

10- Doctors and nurses are the only ones who are competent to give me advice concerning my behaviour during pregnancy.

13- My baby's health is in the hands of health professionals.

18- Only qualified health professionals can tell me what I should and should not do when I am pregnant.

Back translation of Fetal Health Locus of Control into Persian (Study 2)

منبع کنترل سلامت جنین

موارد زیر برای تعیین دیدگاه شما از مسائل مختلف مربوط به سلامت بارداری طراحی شده اند هر مورد نشان دهنده عبارتی است که شما با آن می توانید موافق یا مخالف باشید

در کنار هر عبارت مقیاسی از قطعاً موافق تا قطعاً مخالف وجود دارد

برای هر عبارت می خواهیم که شما پاسخی را که به بهترین وجه نشان دهنده موافقت یا مخالفت شما با آن عبارت هست دایره بکشید

هر چقدر با یک عبارت موافق تر باشید شماره ای را که دور آن دایره میکشید بالاتر خواهد بود

هر چقدر با یک عبارت مخالفتر باشید شماره ای را که دور آن دایره می کشید پایینتر خواهد بود

لطفاً دقت کنید که به هر مورد پاسخ دهید و برای هر مورد تنها یک شماره را دایره بکشید

قطعاً موافق	کمی موافق	کمی مخالف	قطعاً مخالف						
۹	۸	۷	۶	۵	۴	۳	۲	۱	۰

با حضور در کلاس های دوران بارداری آموزش داده شده توسط متخصصان بهداشت با تجربه

من تا حد زیادی می توانم داشتن یک نوزاد سالم و طبیعی را افزایش دهم

۹	۸	۷	۶	۵	۴	۳	۲	۱	۰
---	---	---	---	---	---	---	---	---	---

حتی اگر من مراقبت عالی از خودم داشته باشم وقتی که باردار هستم ، سرنوشت تعیین خواهد کرد که آیا فرزند من طبیعی یا غیر طبیعی خواهد بود

۹	۸	۷	۶	۵	۴	۳	۲	۱	۰
---	---	---	---	---	---	---	---	---	---

کودک من سالم به دنیا خواهد آمد تنها اگر من در دوران بارداری هر چیزی را که دکتر من به من می گوید انجام دهم

۹	۸	۷	۶	۵	۴	۳	۲	۱	۰
---	---	---	---	---	---	---	---	---	---

اگر کودک من ناسالم و یا غیر طبیعی متولد شده است ، طبیعت میخواست که اینطور باشد

۹	۸	۷	۶	۵	۴	۳	۲	۱	۰
---	---	---	---	---	---	---	---	---	---

مراقبتی که من از متخصصان بهداشت دریافت میکنم مسئول سلامت نوزاد متولد نشده من است

۹	۸	۷	۶	۵	۴	۳	۲	۱	۰
---	---	---	---	---	---	---	---	---	---

سلامت جنین من را می توان به طور جدی توسط رژیم غذایی من در دوران بارداری تحت تاثیر قرار داد

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

بهداشت مسئول سلامت جنین من هستند

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

اگر من در دوران بارداری بیمار شوم، مشاوره با دكترم بهترین چیزی است که می توانم برای حفاظت از سلامت نوزاد متولد نشده ام انجام دهم

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

مهم نیست من چی کار کنم وقتی که من باردار هستم ، قوانین طبیعت تعیین خواهد کرد که آیا فرزند من طبیعی خواهد بود یا نه

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

پزشکان و پرستاران تنها کسانی هستند که لایق مشاوره دادن در مورد رفتار من در دوران بارداری هستند

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

خدا تعیین کننده سلامت فرزند من است

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

آموزش نحوه مراقبت از خودم قبل از باردار شدن کمک می کند تا فرزند من سالم به دنیا بیاید

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

سلامت کودک من در دست متخصصان بهداشت است

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

سرنوشت سلامت جنین من را تعیین میکند

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

آنچه که من انجام میدهم تا زمانی که نوزاد من به دنیا بیاید ، می تواند در سلامت نوزاد من تاثیر بگذارد

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

داشتن یک سقط جنین برای من به معنای این هست که نوزاد من قرار نبوده که زنده بماند

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

قبل از حامله شدن ، به منظور داشتن نوزاد سالم ، من یاد گرفتم چه چیزهای خاصی باید و نباید در دوران بارداری انجام دهم

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

تنها متخصصان بهداشت واجد شرایط می توانند به من بگویند چه باید و نباید در دوران بارداری انجام ده

۰ ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸ ۹

Maternal Health Practices Questionnaire-II (HPQ-II) (Study 2)

Circle the one answer that best describes your actions since you found out you were pregnant.

1-Since becoming pregnant, I think I am practicing a healthy lifestyle:

Never Rarely Sometimes Often Always

2-Since becoming pregnant, I have gotten at least 7 to 8 total hours of sleep a night:

Never Rarely Sometimes Often Always

3-Since becoming pregnant, I have exercised regularly (for at least 20 minutes a day, at least 3 times a week):

Never Rarely Sometimes Often Always

4- Since becoming pregnant, I have used seatbelts, when available, when driving in a car, truck, or van:

Never Rarely Sometimes Often Always

5- Since becoming pregnant, I drink more than 2 caffeinated beverages (coffee, tea, colas, or soda) in a day:

Never Rarely Sometimes Often Always

6-When I have concerns about my health or the health of my baby, I report them to my doctor or midwife:

Never Rarely Sometimes Often Always

7-When I have questions about my pregnancy or there is something I don't understand, I ask my doctor or midwife:

Never Rarely Sometimes Often Always

8-Since becoming pregnant, I have taken herbal remedies other than those recommended to me by my doctor or midwife:

Never Rarely Sometimes Often Always

9-Since becoming pregnant, I have read food labels to be sure I am buying an item that will be good for me and my baby (for example, not too high in salt or fat, avoiding artificial sweeteners, good sources of vitamins):

Never Rarely Sometimes Often Always

10-Since becoming pregnant, I have limited or avoided exposure to toxic chemicals and other substances (For example, second-hand smoke, insecticides/ pesticides, leads in drinking water):

Never Rarely Sometimes Often Always

11- Since becoming pregnant, I talk to my doctor or midwife before taking any medication or supplement:

Never Rarely Sometimes Often Always

12-Since becoming pregnant, I have taken my multivitamins or prenatal vitamins if recommended by my doctor or midwife:

Never 1-2 times a week 3-4 times a week 5-6 times a week
Daily

13-Since becoming pregnant, I take in adequate calcium (1200mg/day), by eating dairy products or other calcium rich foods, or taking supplements:

Never 1-2 times a week 3-4 times a week 5-6 times a week Daily

14- Since becoming pregnant, I have eaten five servings of fruits and/or vegetables in a day:

Never 1-2 times a week 3-4 times a week 5-6 times a week Daily

15-Since becoming pregnant, I have eaten enough fibre or roughage in my diet (grain breads, high fibre cereals, fruits and vegetables):

Never 1-2 times a week 3-4 times a week 5-6 times a week Daily

16- Since becoming pregnant, I have smoked cigarettes:

Never Smoked Quit since finding out I was pregnant

Less than 10 cigarettes a day 11-20 cigarettes daily More than a pack a day

17- I began seeing my doctor or midwife for prenatal care:

To plan a pregnancy before conception In the first 3 months of pregnancy

Before 5 months of pregnancy Before 7 months of pregnancy

Before 9 months of pregnancy

18- I have missed an appointment (means forgot to schedule or didn't show up for an appointment) with my doctor or midwife:

Never missed an appointment Missed one appointment

Missed 2-3 appointments Missed 4-5 appointments

Missed more than 5 appointments

19- Since becoming pregnant, I have gotten regular dental care (professional cleaning every 6 months or dental work):

I do not get regular dental care I have not been to the dentist although I am due for dental care

I do not know if I need dental care at this time

I have visited a dentist and had some care but not everything needed

I have visited a dentist and had all dental care done or I am not due for a visit to a dentist since I became pregnant

20- Since becoming pregnant, I have looked at books, pamphlets, videos, or the internet to learn more about pregnancy and childbirth:

Never Less than or one time a month 2-3 times a month

4 times a month (weekly) More than 4 times a month

21- Since becoming pregnant, I have talked with friends and family members to learn more about pregnancy and childbirth:

Never Less than or one time a month 2-3 times a month

4 times a month (weekly) More than 4 times a month

22- Since becoming pregnant, I have taken time to do something relaxing for myself:

Never Less than or one time a week 1-2 times a week

3-5 times a week More than 5 times a week

23- Since becoming pregnant, I have gained the amount of weight recommended by my doctor or midwife for this time in pregnancy:

I have lost weight I have gained too little or too much weight

I have not gained or lost weight I do not know

I have gained the right amount of weight

24- Since becoming pregnant, I drink water, fruit or vegetable juices, or other fluids without caffeine daily:

Less than 3 (8 oz.) glasses of fluid a day

3-4 (8 oz.) glasses of fluid a day

5-6 (8 oz.) glasses of fluid a day

7-8 (8 oz.) glasses of fluid a day

More than 8 (8 oz.) glasses of fluid a day

25- Since becoming pregnant, I have minimized my chances of getting toxoplasmosis by avoiding cat faeces and not eating raw or undercooked meat and by using gloves when working in the garden:

Always 5 days a week 3 days a week Sometimes Never

26- I have attended or plan to attend childbirth classes:

Definitely yes No, I have taken before Not sure Probably not

Definitely no

27- How happy are you to be pregnant?

Very unhappy Unhappy Neither happy or unhappy Happy

Very happy

Removed Items from Maternal Health Practices Questionnaire-II (HPQ-II) Due to Cultural Differences (Study 2)

1- Since becoming pregnant, I have used marijuana:

Never Rarely Sometimes Often Always

2- Since becoming pregnant, I have used cocaine, crack cocaine, amphetamines or speed, LSD, heroin, or inhalants:

Never Rarely Sometimes Often Always

3- Since becoming pregnant, my partner and/or I have had sex with other people:

Never Rarely Sometimes Often Always

4- Since becoming pregnant, I take actions that reduce my risk for getting sexually transmitted diseases (for example, I have used condoms or avoided intercourse):

Never Rarely Sometimes Often Always

5- Since becoming pregnant, I have douched:

Never Rarely Sometimes Often Always

6- Since becoming pregnant, I have avoided bathing or sitting in water that exceeds 100 degrees F:

Never Rarely Sometimes Often Always

7- Since becoming pregnant, I have had alcoholic beverages (wine, beer, or liquor):

No alcoholic drinks while pregnant Before knowing I was pregnant

Less than 3 times a month

1 time a week

More than 1 time a week

8- Since becoming pregnant, at one sitting I usually drink (a drink is equal to a 12 ounce bottle of beer, 4 oz. of wine or a shot of liquor):

No drinks while pregnant 1 drink 2 drinks 3 drinks More than 3 drinks

Back translation of Maternal Health Practices Questionnaire-II (HPQ-II) into Persian (Study 2)

سنجش رفتارهای بهداشتی دوران بارداری

مادر عزیز:

لطفاً پاسخی را که به بهترین شکل رفتارهای شما را بعد از اینکه متوجه شدید باردار هستید توصیف می کند دایره بکشید.

۱- از وقتی باردار شدم فکر می کنم زندگی سالمی را تجربه می کنم:

اصلاً	بندرت	گاهی اوقات	اغلب
همیشه			

۲- از وقتی باردار شدم حد اقل ۷ الی ۸ ساعت در شب می خوابم:

اصلاً	بندرت	گاهی اوقات	اغلب
همیشه			

۳- از وقتی باردار شدم بطور مرتب حداقل ۲۰ دقیقه در روز و حداقل سه بار در هفته ورزش می کنم:

اصلاً	بندرت	گاهی اوقات	اغلب
همیشه			

۴- از وقتی باردار شدم در موقع رانندگی از کمر بند ایمنی استفاده می کنم:

اصلاً	بندرت	گاهی اوقات	اغلب
همیشه			

۵- از وقتی باردار شدم بیشتر از دو بار در روز نوشیدنی های کافئین دار (چای، قهوه، کولا) می نوشم:

اصلاً	بندرت	گاهی اوقات	اغلب
همیشه			

۶- وقتی در باره سلامتی خود و بچه ام نگرانم به دکتر و یا ماما گزارش می دهم:

اصلاً	بندرت	گاهی اوقات	اغلب
همیشه			

۷- وقتی در باره بارداری ام سوال دارم و یا چیزی را نمی فهمم از دکتر و یا ماما می پرسم:

- اصلا بندرت گاهی اوقات اغلب همیشه
- ۸- از وقتی باردار شدم درمان های گیاهی را بیشتر از آن که توسط دکترم و ماما تجویز شده استفاده می کنم:
- اصلا بندرت گاهی اوقات اغلب همیشه
- ۹- از وقتی باردار شدم برچسب مواد غذایی را میخوانم تا مطمئن شوم چیزها کم می خرم برای خودم و بچه ام خوب است (مثلا نه خیلی نمک دار و نه خیلی چرب):
- اصلا بندرت گاهی اوقات اغلب همیشه
- ۱۰- از وقتی باردار شدم از بودن در معرض مواد سمی مثل حشره کش ها اجتناب می کنم:
- اصلا بندرت گاهی اوقات اغلب همیشه
- ۱۱- از وقتی باردار شدم قبل از مصرف هر دارو و یا مکمل با دکترم و یا ماما صحبت می کنم:
- اصلا بندرت گاهی اوقات اغلب همیشه
- ۱۲- از وقتی باردار شدم مولتی ویتامین ها و ویتامین های مربوط به قبل از تولد را که دکترم و ماما تجویز کرده اند مصرف می کنم:
- اصلا ۱ تا ۲ بار در هفته ۳ تا ۴ بار در هفته ۵ تا ۶ بار در هفته روزانه
- ۱۳- از وقتی باردار شدم به مقدار کافی کلسیم (۱۲۰۰ mg/روزانه) از طریق محصولات لبنی، غذاهای غنی از کلسیم و مکمل ها) مصرف می کنم:
- اصلا ۱ تا ۲ بار در هفته ۳ تا ۴ بار در هفته ۵ تا ۶ بار در هفته روزانه
- ۱۴- از وقتی باردار شدم روزانه پنج وعده میوه و سبزیجات می خورم:
- اصلا ۱ تا ۲ بار در هفته ۳ تا ۴ بار در هفته ۵ تا ۶ بار در هفته روزانه

۱۵- از وقتی باردار شدم در رژیم غذایی ام به مقدار کافی فیبر و سبوس مثل نان غلات و غلات با فیبر بالا مصرف کرده ام:

اصلا ۱ تا ۲ بار در هفته ۳ تا ۴ بار در هفته ۵ تا ۶ بار در هفته
روزانه

۱۶- از وقتی باردار شدم سیگار می کشم:

اصلا از وقتی متوجه شدم باردارم ترک کردم کمتر از ۱۰ سیگار در روز روزانه بین ۱۱-۲۰ سیگار بیشتر از یک پاکت در روز

۱۷- من شروع به دیدن دکترم و ماما کردم برای مراقبت های دوران بارداری:

از قبل از لقاح برای برنامه ریزی بارداری در اولین سه ماه بارداری قبل از ۵ ماه بارداری قبل از ۷ ماه بارداری قبل از ۹ ماه بارداری

۱۸- از وقتی باردار شدم قرار ملاقات با دکتر و ماما را:

اصلا از دست نداده ام یک بار را از دست دادم ۲-۳ بار را از دست دادم ۴-۵ بار را از دست دادم بیشتر از ۵ بار از دست دادم

۱۹- از وقتی باردار شدم بطور مرتب هر ۶ ماه برای چک آپ به دندانپزشکی مراجعه کرده ام:

به طور مرتب به دندانپزشک مراجعه نکرده ام به دندانپزشک مراجعه نکرده ام اگر چه زمان آن نزدیک است

نمی دانم که در حال حاضر نیاز به دندانپزشک دارم یا نه یک دندانپزشک را ملاقات کردم ولی کار زیادی نیاز نبود

یک دندانپزشک را ملاقات کردم و هر چی نیاز بود انجام دادم از وقتی باردار شدم نیازی به دندانپزشک نداشتم

۲۰- از وقتی باردار شدم به کتابها، بروشورها و اینترنت برای کسب اطلاعات بیشتر در باره بارداری و زایمان مراجعه می کنم:

اصلا کمتر از و یا یک بار در ماه ۲-۳ بار در ماه ۴ بار در ماه (هفتگی)
بیشتر از ۴ بار در ماه

۲۱- از وقتی باردار شدم با دوستان و اعضای خانواده ام برای کسب اطلاعات بیشتر در باره بارداری و زایمان صحبت می کنم:

اصلا کمتر از و یا یک بار در ماه ۳-۲ بار در ماه ۴ بار در ماه (هفتگی)
بیشتر از ۴ بار در ماه

۲۲- از وقتی باردار شدم زمان هایی را برای آرامش خودم در نظر می گیرم

اصلا کمتر از یا یک بار در هفته ۲-۱ بار در هفته ۵-۳ بار در هفته
بیشتر از ۵ بار در هفته

۲۳- از وقتی باردار شدم مقدار وزنی را که توسط دکتر و ماما برای این زمان از بارداری تجویز کرده اند کسب کرده ام:

من وزن از دست داده ام خیلی کم و یا خیلی زیاد وزن کسب کرده ام نه وزن از دست دادم و نه اضافه کردم

نمی دانم به مقدار مناسب وزن اضافه کردم

۲۴- از وقتی باردار شدم آب، آب میوه و سبزیجات و مایعات دیگر بدون کافئین می نوشم:

کمتر از سه لیوان مایعات در روز ۴-۳ لیوان مایعات در روز ۶-۵ لیوان مایعات در روز
۸-۷ لیوان مایعات در روز

بیشتر از ۸ لیوان مایعات در روز

۲۵- من احتمال مبتلا شدن به توکسوپلاسموز را با اجتناب از مدفوع گربه، خوردن گوشت خام و یا نپخته و استفاده از دستکش هنگام کار در باغ به حداقل میرسانم:

همیشه ۵ روز در هفته ۳ روز در هفته گاهی اوقات
اصلا

۲۶- من شرکت کرده ام و یا قصد دارم در کلاس های زایمان و بارداری شرکت کنم:

قطعاً بلی خیر، قبلاً شرکت کرده ام مطمئن نیستم احتمالاً خیر
قطعاً خیر

۲۷- چقدر از باردار بودن خوشحال هستی؟

خیلی ناراحت ناراحت نه خوشحال نه ناراحت خوشحال
خیلی خوشحال

Appendix B

Consent, Information and Debriefing Sheets (Study 1 and Study 2)

Written Informed Consent (Study 1)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

**Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email:
b.baluch@mdx.ac.uk**

**Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:
m.pirjalian@mdx.ac.uk**

Title of research: Public Perception on Children Born by Egg Donation

I have understood the details of the research as explained to me by the researcher, and confirm that I have consented to act as a participant.

I have been given contact details of the researcher.

I understand that my participation is entirely voluntary, the data collected during the research will not be identifiable, and I have the right to withdraw from the project at any time without any obligation to explain my reasons for doing so.

I further understand that the data I provide may be used for analysis and subsequent publication, and I provide my consent that this may occur.

Print name

Sign Name

Date:

To the participant: Data may be inspected by the Chair of the Psychology Ethics panel and the Chair of the School of Science and Technology Ethics Committee of Middlesex University, if required by institutional audits about the correctness of procedures. Although this would happen in strict confidentiality, please tick here if you do not wish your data to be included in audits: _____.

Written Informed Consent in Persian (Study 1)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email:
b.baluch@mdx.ac.uk

Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:
m.pirjalian@mdx.ac.uk

عنوان پژوهش:

سنجش ادراک افراد در مورد کودکان متولد شده از اهدا تخمک

• من تایید می کنم جزئیات این پژوهش را درک کرده ام همانطور که توسط پژوهشگر به من توضیح داده شد و موافقت کرده ام تا به عنوان یکی از شرکت کنندگان عمل کنم.

• به من جزئیات تماس با محقق شده است.

• من درک می کنم که شرکت من کاملاً داوطلبانه، اطلاعات جمع آوری شده در طول تحقیقات غیر قابل شناسایی، و من حق خروج از پروژه در هر زمان و بدون هر گونه تعهد به توضیح دلایل را داشته باشم.

• بعلاوه من درک و موافقت می کنم که داده هایی که ارائه داده ام ممکن است برای تجزیه و تحلیل و انتشار پس از آن استفاده شود.

تاریخ:

امضاء:

نام:

به شرکت کنندگان: داده ها ممکن است توسط رییس پانل اخلاق روانشناسی و رئیس کمیته اخلاق دانشکده علوم و تکنولوژی از دانشگاه Middlesex بازرسی شود، در صورتی که توسط ممیزی سازمانی در مورد صحت روش مورد نیاز باشد، اگر چه این کاملاً محرمانه رخ می دهد، لطفاً اینجا را تیک بزنید اگر مایل به این امر نیستید

Information Sheet (Study 1)

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Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

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b.baluch@mdx.ac.uk**

**Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:
m.pirjalian@mdx.ac.uk**

Title of research: Public Perception on Children Born by Egg Donation

You are being invited to take part in a research study. Before you decide to participate, it is important for you to understand why the research is being done and what it will involve.

Please take your time to read the following information carefully, and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take your time to decide whether or not you wish to take part.

You will be given a copy of the consent form to sign prior to taking part in the research. All proposals for research using human participants are reviewed by an Ethics Committee before they can proceed. The Middlesex Psychology Department's Ethics Committee has reviewed this proposal.

The purpose of this study is to investigate your perception on children born via egg donation. We would like you to complete a short questionnaire.

Participation in this study is voluntary and you do not have to take part. You can withdraw at any time without giving a reason. No identity information is needed. Anonymity and confidentiality are therefore ensured. There are no known risks involved in taking part in this study. In the unlikely case you may become emotionally distressed during the study, please contact one of us (contact details above) and we will arrange for you to get access to the counselling services. Thank you for participating as a research participant in the present study.

Information Sheet in Persian (Study 1)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email:
b.baluch@mdx.ac.uk

Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:
m.pirjalian@mdx.ac.uk

عنوان پژوهش : سنجش ادراک افراد در مورد کودکان متولد شده از اهدا تخمک

ما شما را دعوت به شرکت در یک مطالعه تحقیقاتی کرده ایم. قبل از تصمیم به شرکت کردن ، مهم است برای شما به درک اینکه چرا پژوهش در حال انجام است و چه را شامل می شود.

لطفا اطلاعات زیر را به دقت بخوانید و اگر می خواهید در مورد آن با دیگران بحث کنید.

لطفا اگر چیزی است که مشخص نیست و یا اگر اطلاعات بیشتری می خواهید پرسید. برای تصمیم گیری وقت بگذارید که می خواهید در آن شرکت کنید یا نه.

قبل از شرکت در پژوهش به شما یک کپی از فرم رضایت داده می شود.

تمام پیشنهادات برای تحقیقات با استفاده از شرکت کنندگان انسان توسط یک کمیته اخلاق قبل از اینکه آنها بتوانند ادامه پیدا کنند بررسی می شوند.

کمیته اخلاق گروه روانشناسی دانشگاه Middlesex و بیمارستان فیروزگر این پیشنهاد را بررسی کرده اند.

هدف از این مطالعه بررسی نگرش شما نسبت به کودکان متولد شده از طریق روش اهدا تخمک (از نظر اجتماعی، روانی و آموزشی) است. ما می خواهیم شما یک پرسشنامه کوتاه را تکمیل کنید.

شرکت در این مطالعه داوطلبانه است و اجباری نیست.

شما می توانید در هر زمان و بدون دادن هیچ دلیلی پژوهش را ترک کنید.

هیچ نوع اطلاعات هویتی مورد نیاز نیست. بنابراین گمنام ماندن و محرمانه بودن تضمین می شود.

هیچ نوع خطری در شرکت کردن در این مطالعه وجود ندارد.

در موارد بعید اگر در طول مطالعه دچار مشکلات عاطفی شدید، لطفا با یکی از ما (جزییات تماس در بالا) تماس و ما ترتیب دسترسی به خدمات مشاوره برای شما را خواهیم داد.

با تشکر از شما به عنوان یکی از شرکت کنندگان پژوهش در مطالعه حاضر

Debriefing Sheet (Study 1)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

**Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email:
b.baluch@mdx.ac.uk**

**Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:
m.pirjalian@mdx.ac.uk**

Thank you for participating in this study, which is part of my doctoral research project at Middlesex University looking at:

Public Perception on Children Born by Egg Donation

The questionnaire/statements are based on research findings from mainly Western studies on children conceived through assisted reproduction techniques and egg donation. The aim of this study is to see what views and perception people may have about such findings and to compare your opinions and comments with those directly involved in egg donation practices.

I confirm that:

This research has been carried out in a professional and ethical manner.

You may choose to withdraw your data without explanation by contacting us via email (please find contact details above).

If you have further questions regarding this research please contact myself or my supervisor at the contact details given above.

Debriefing Sheet in Persian (Study 1)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email:

b.baluch@mdx.ac.uk

Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:

m.pirjalian@mdx.ac.uk

با تشکر از شما برای شرکت در این مطالعه که بخشی از پروژه تحقیقاتی دکترای من در دانشگاه Middlesex است با عنوان: **سنجش ادراک افراد در مورد کودکان متولد شده از اهدا تخمک**.

اظهارات در پرسشنامه، از یافته های پژوهش از مطالعات عمد تا غربی در مورد تأثیر روشهای کمک باروری و روش اهدا تخمک بر کودکان به دست آمده است. هدف این است که ببینیم در مورد این یافته ها افراد و شما چطور فکر می کنید و پاسخ و نظرات شما را با کسانی که به طور مستقیم با کودکان اهدا تخمک درگیر هستند مقایسه کنیم.

من تایید می کنم که :

- این پژوهش به شیوه ای حرفه ای و اخلاقی انجام شده است.
- شما برای پس گرفتن داده های خود بدون هیچ گونه توضیحی آزاد هستید (جزئیات تماس در بالای صفحه داده شده است).
- اگر سوالات بیشتری در مورد این تحقیق دارید لطفا باخودم یا استاد راهنمای من تماس بگیرید (جزئیات تماس در بالای صفحه داده شده است).

Written Informed Consent (Study 2)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

**Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email:
b.baluch@mdx.ac.uk**

**Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:
m.pirjalian@mdx.ac.uk**

**Title of research: Conception by Egg Donation: Maternal-Fetal Attachment,
Fetal Health Locus of Control and Maternal Health practices amongst Iranian
women pregnant via Egg Donation and Naturally**

I have understood the details of the research as explained to me by the researcher, and confirm that I have consented to act as a participant.

I have been given contact details of the researcher.

I understand that my participation is entirely voluntary, the data collected during the research will not be identifiable, and I have the right to withdraw from the project at any time without any obligation to explain my reasons for doing so.

I understand that I can ask for my data to be withdrawn from the project up until the data analysis begins in October 2015.

I further understand that the data I provide may be used for analysis and subsequent publication, and I provide my consent that this may occur.

Print name:

Sign:

Date:

To the participant: Data may be inspected by the Chair of the Psychology Ethics panel and the Chair of the School of Science and Technology Ethics Committee of Middlesex University, if required by institutional audits about the correctness of procedures. Although this would happen in strict confidentiality, please tick here if you do not wish your data to be included in audits: _____ .

Written Informed Consent in Persian (Study 2)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email:

b.baluch@mdx.ac.uk

Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:

m.pirjalian@mdx.ac.uk

عنوان پژوهش : بررسی ارتباط بین دلبستگی مادر جنین، منبع کنترل سلامت جنین و شیوه های سلامت مادران در میان زنان باردار ایرانی که از طریق اهدا تخمک و روش طبیعی باردار شده اند می باشد

• من تایید می کنم جزئیات این پژوهش را درک کرده ام همانطور که توسط پژوهشگر به من توضیح داده شد و موافقت کرده ام تا به عنوان یکی از شرکت کنندگان عمل کنم.

• به من جزئیات تماس با محقق در برگه اطلاعات داده شده است.

• من درک می کنم که شرکت من کاملاً داوطلبانه، اطلاعات جمع آوری شده در طول تحقیقات غیر قابل شناسایی، و من حق خروج از پروژه در هر زمان و بدون هر گونه تعهد به توضیح دلایل را داشته باشم.

• بعلاوه من درک و موافقت می کنم که داده هایی که ارائه داده ام ممکن است برای تجزیه و تحلیل و انتشار پس از آن استفاده شود.

تاریخ:

امضاء:

نام:

به شرکت کنندگان: داده ها ممکن است توسط رییس پانل اخلاق روانشناسی و رئیس کمیته اخلاق دانشکده علوم و تکنولوژی از دانشگاه Middlesex بازرسی شود، در صورتی که توسط ممیزی سازمانی در مورد صحت روش مورد نیاز باشد، اگر چه این کاملاً محرمانه رخ می دهد، لطفاً اینجا را تیک بزنید اگر مایل به این امر نیستید _____

Information Sheet (Study 2)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email: b.baluch@mdx.ac.uk

Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:

m.pirjalian@mdx.ac.uk

Title of research: Conception by Egg Donation: Maternal-Fetal Attachment, Fetal Health Locus of Control and Maternal Health practices amongst Iranian women pregnant via Egg Donation and Naturally

You are being invited to take part in a research study. Before you decide to participate, it is important for you to understand why the research is being done and what it will involve.

Please take your time to read the following information carefully, and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take your time to decide whether or not you wish to take part. You will be given a copy of the consent form to sign prior to taking part in the research.

All proposals for research using human participants are reviewed by an Ethics Committee before they can proceed. The Middlesex Psychology Department's Ethics Committee and Firoozgar Hospital has reviewed this proposal.

The purpose of this study is to investigate your attitudes and thoughts towards your fetus and what kind of health behaviours you choose for your own health and the health of your fetus and to what extent you attribute these health behaviours to yourself, fate and/or health professionals. In addition, you are also expected to complete a short questionnaire with information such as your age, marital status etc.

Participation in this study is voluntary and you do not have to take part. You can withdraw at any time without giving any reasons.

No identity information is needed. Anonymity and confidentiality are therefore ensured. There are no known risks involved in taking part in this study. In the unlikely case you may become emotionally distressed during the study, please contact myself (contact details above) or contact the counselling services (Firoozgar Hospital). Thank you for participating as a research participant in the present study.

Information Sheet in Persian (Study 2)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

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m.pirjalian@mdx.ac.uk

عنوان پژوهش : بررسی ارتباط بین دلبستگی مادر جنین، منبع کنترل سلامت جنین و شیوه های سلامت مادران در میان زنان باردار ایرانی که از طریق اهدا تخمک و روش طبیعی باردار شده اند می باشد

ما شما را دعوت به شرکت در یک مطالعه تحقیقاتی کرده ایم. قبل از تصمیم به شرکت کردن ، مهم است برای شما به درک اینکه چرا پژوهش در حال انجام است و چه را شامل می شود. لطفا اطلاعات زیر را به دقت بخوانید و اگر می خواهید در مورد آن با دیگران بحث کنید. لطفا اگر چیزی است که مشخص نیست و یا اگر اطلاعات بیشتری می خواهید بپرسید. برای تصمیم گیری وقت بگذارید که می خواهید در آن شرکت کنید یا نه.

قبل از شرکت در پژوهش به شما یک کپی از فرم رضایت داده می شود.

تمام پیشنهادات برای تحقیقات با افراد انسانی توسط یک کمیته اخلاق قبل از اینکه آنها بتوانند ادامه پیدا کنند بررسی می شوند. کمیته اخلاق گروه روانشناسی دانشگاه Middlesex و بیمارستان فیروزگر این پیشنهاد را بررسی کرده اند.

هدف از این مطالعه بررسی نگرش شما به جنین و انتخاب روشها و رفتارهای سلامت در طول دوران بارداری می باشد. ما می خواهیم شما یک پرسشنامه کوتاه را تکمیل کنید.

شرکت در این مطالعه داوطلبانه است و اجباری نیست.

شما می توانید در هر زمان و بدون دادن هیچ دلیلی پژوهش را ترک کنید.

هیچ نوع اطلاعات هویتی مورد نیاز نیست. بنابراین گمنام ماندن و محرمانه بودن تضمین می شود.

هیچ نوع خطری در شرکت کردن در این مطالعه وجود ندارد.

در موارد بعید اگر در طول مطالعه دچار مشکلات عاطفی شدید، لطفا با یکی از ما (جزییات تماس در بالا) تماس و ما ترتیب دسترسی به خدمات مشاوره برای شما را خواهیم داد. با تشکر از شما به عنوان یکی از شرکت کنندگان پژوهش در مطالعه حاضر

Debriefing Sheet (Study 2)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

**Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email:
b.baluch@mdx.ac.uk**

**Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:
m.pirjalian@mdx.ac.uk**

**Title of research: Conception by Egg Donation: Maternal-Fetal Attachment,
Fetal Health Locus of Control and Maternal Health practices amongst Iranian
women pregnant via Egg Donation and Naturally**

Thank you for participating in this study which is part of my doctoral research project at Middlesex University looking at: **Conception by Egg Donation: Maternal-Fetal Attachment, Fetal Health Locus of Control and Maternal Health practices amongst Iranian women pregnant via Egg Donation and Naturally.**

The aim of this current study is to measure prenatal attachment, which means attitudes and feelings towards the pregnancy and the baby, fetal health locus of control and health behaviours during pregnancy amongst those who conceived through egg donation and naturally. The results of my study should provide more information about the extent to which women's attitudes and feelings to the above measures has an impact on their health behaviour and the health of their fetus. I would be happy to discuss any aspect of my study if you wish. Please contact myself or my supervisor on the above address for further information.

I confirm that:

This research has been carried out in a professional and ethical manner.

You may choose to withdraw your data without explanation by contacting us via email (please find above). If you have further questions regarding this research please contact myself or my supervisor at the contact details given above.

Debriefing Sheet in Persian (Study 2)

Middlesex University, School of Science and Technology,

Psychology Department

The Town Hall, The Burroughs, Hendon, London, NW4 4BT

Supervisor: Dr Bahman Baluch, Tel: +44 (0) 2084115375, Email:

b.baluch@mdx.ac.uk

Doctoral Researcher: Manijeh Pir Jalian, Tel: +44 (0) 2084115014, Email:

m.pirjalian@mdx.ac.uk

با تشکر از شما برای شرکت در این مطالعه که بخشی از پروژه تحقیقاتی دکترای من در دانشگاه Middlesex است با عنوان بررسی ارتباط بین دل‌بستگی مادر جنین، منبع کنترل سلامت جنین و شیوه‌های سلامت مادران در میان زنان باردار که از طریق اهدا تخمک و روش طبیعی باردار شده‌اند می‌باشد.

هدف از این مطالعه این است که ببینیم زنان باردار از طریق طبیعی و از طریق اهدا تخمک چه نگرشی نسبت به جنین خود دارند و چه روش‌هایی را برای سلامت خود و جنین انتخاب می‌کنند و تا چه اندازه این روشها یا رفتارهای سلامت را به خودشان و یا به عوامل بیرونی نسبت می‌دهند و بعد این دو گروه را با هم مقایسه کنیم .

من تایید می‌کنم که :

• این پژوهش به شیوه‌ای حرفه‌ای و اخلاقی انجام شده است.

• شما برای پس گرفتن داده‌های خود بدون هیچ‌گونه توضیحی آزاد هستید تا با ما (جزئیات تماس در بالای صفحه) تماس بگیرید.

اگر سوالات بیشتری در مورد این تحقیق دارید لطفاً باخودم یا استاد راهنمای من تماس بگیرید (جزئیات تماس در بالای صفحه داده شده است).

Appendix C

Ethics Approval (Study 1 and Study 2)



**Middlesex University Department of Psychology
Application for Ethical Approval and Risk Assessment**

No study may proceed until approval has been granted by an authorised person. For collaborative research with another institution, ethical approval must be obtained from all institutions involved. If you are involved in a project that has already received ethical approval from another committee or that will be seeking approval from another ethics committee please complete form 'Application for Approval of Proposals Previously Approved by another Ethics Committee or to be Approved by another Ethics Committee'

UG and MSc STUDENTS: Please email the completed form to your supervisor from your University email account (...@live.mdx.ac.uk). Your supervisor will then send your application to the Ethics Committee (Psy.Ethics@mdx.ac.uk). You should NOT email the ethics committee directly.

PhD Students and STAFF: Please email the completed form to Psy.Ethics@mdx.ac.uk from your University email account (...@mdx.ac.uk)

This form consists of 8 sections:

- 1) Summary of Application and Declaration
- 2) Ethical questions
- 3) Research proposal
- 4) Information sheet
- 5) Informed consent
- 6) Debriefing
- 7) Risk assessment (required if research is to be conducted away from Middlesex University property, otherwise leave this blank. Institutions/locations listed for data collection must match original letters of acceptance)
- 8) Reviewer's decision and feedback

Once your file including proposal, information sheet, consent form, debriefing and (if necessary) materials and Risk Assessment form is ready, please check the size. For files exceeding 3MB, please email your application to your supervisor using WeTransfer: <https://www.wetransfer.com/> this will place your application in cloud storage rather than sending it directly to a specific email account. If you/ your supervisor have confidentiality concerns, please submit a paper copy of your application to the Psychology Office instead of proceeding with the electronic submission.

FOR OFFICE USE ONLY

Application No.:	PG001	Decision:	Approved	Date:	23.09.14
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RISK ASSESSMENT (complete relevant boxes):

Required:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Signed by:	<input checked="" type="checkbox"/> Student	<input checked="" type="checkbox"/> Supervisor	<input checked="" type="checkbox"/> Programme Leader
Date:				12.09.14	12.09.14	23.09.14

LETTER/S OF ACCEPTANCE/PERMISSION MATCHING FRA1 (RISK ASSESSMENT) RECEIVED (SPECIFY):

	Date	From	Checked by
All	10.06.14	Iran University of Medical Sciences	<input checked="" type="checkbox"/> Supervisor <input checked="" type="checkbox"/> Ethics Admin
Part	Click here to enter a date.	Click here to enter text.	<input type="checkbox"/> Supervisor <input type="checkbox"/> Ethics Admin
Part	Click here to enter a date.	Click here to enter text.	<input type="checkbox"/> Supervisor <input type="checkbox"/> Ethics Admin

DBS Certificate(s) Required? (complete relevant boxes):

NO	Received:	Click here to choose an item.	Seen By:	<input type="checkbox"/> Supervisor <input type="checkbox"/> Ethics Admin
----	------------------	-------------------------------	-----------------	---

Added to File:	Click here to choose an item.	Date:	Click here to enter a date.
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1 Summary of application (researcher to complete)

Title of Proposal:	Psychological and Social Aspects of Children Born by Assisted Reproductive Technologies (ARTs) in Iran		
Submitted by:	Manijeh Pir Jalian		
Name of Principal Investigator/Supervisor	Dr Bahman Baluch		
Name of Student Researcher(s) and student number(s)	Manijeh Pir Jalian M00322166		
Proposed start date	20/10/2014	Proposed end date	31/10/2015

Details of any co-investigators (if applicable)

Manijeh Pir Jalian M00322166

1.	Name:	Organisation:	Email:
2.	Name:	Organisation:	Email:
3.	Name:	Organisation:	Email:

Topic/Research Area (tick as many boxes as apply)

<input type="checkbox"/> Clinical	<input type="checkbox"/> Forensic	<input type="checkbox"/> Cognition & Emotion	<input type="checkbox"/> Health	<input type="checkbox"/> Sport & Exercise
<input type="checkbox"/> Occupational	<input type="checkbox"/> Developmental	<input checked="" type="checkbox"/> Social/Psychosocial	<input type="checkbox"/> Psychophysiological	

Methodology (tick as many boxes as apply)

<input checked="" type="checkbox"/> Qualitative	<input type="checkbox"/> Experimental	<input type="checkbox"/> Field Experiments	<input type="checkbox"/> Qualitative
<input type="checkbox"/> Observation (humans and non-humans)	<input type="checkbox"/> Analysis of Existing Data Source/Secondary Data Analysis		

1.1	Are there any sensitive elements to this study (delete as appropriate)? <i>If you are unclear about what this means in relation to your research please discuss with your Supervisor first</i>	No
1.2	If the study involves any of the first three groups above, the researcher may need a DBS certificate (Criminal Records Check). PG students are expected to have DBS clearance. Does the current project require DBS clearance? <i>Discuss this matter with your supervisor if you unsure</i>	No
1.3	Does the study involve ANY of the following? <i>Clinical populations; Children (under 16 years); Vulnerable adults such as individuals with mental or physical health problems, prisoners, vulnerable elderly, young offenders; Political, ethnic or religious groups/minorities; Sexually explicit material / issues relating to sexuality; Mood induction; Deception</i>	No
1.4	Is this a resubmission / amended application? <i>If so, you must attach the original application with the review decision and comments (you do not need to re-attach materials etc if the resubmission does not concern alterations to these). Please note that in the case of complex and voluminous applications, it is the responsibility of the applicant to identify the amended parts of the resubmission.</i>	No



**Middlesex University Department of Psychology
Application for Ethical Approval and Risk Assessment**

No study may proceed until approval has been granted by an authorised person. For collaborative research with another institution, ethical approval must be obtained from all institutions involved. If you are involved in a project that has already received ethical approval from another committee or that will be seeking approval from another ethics committee please complete form 'Application for Approval of Proposals Previously Approved by another Ethics Committee or to be Approved by another Ethics Committee'

UG and MSc STUDENTS: Please email the completed form to your supervisor from your University email account (...@live.mdx.ac.uk). Your supervisor will then send your application to the Ethics Committee (Psy.Ethics@mdx.ac.uk). You should NOT email the ethics committee directly.

PhD Students and STAFF: Please email the completed form to Psy.Ethics@mdx.ac.uk from your University email account (...@mdx.ac.uk)

This form consists of 8 sections:

- 1) Summary of Application and Declaration
- 2) Ethical questions
- 3) Research proposal
- 4) Information sheet
- 5) Informed consent
- 6) Debriefing
- 7) Risk assessment (required if research is to be conducted away from Middlesex University property, otherwise leave this blank. Institutions/locations listed for data collection must match original letters of acceptance)
- 8) Reviewer's decision and feedback

Once your file including proposal, information sheet, consent form, debriefing and (if necessary) materials and Risk Assessment form is ready, please check the size. For files exceeding 3MB, please email your application to your supervisor using WeTransfer: <https://www.wetransfer.com/> this will place your application in cloud storage rather than sending it directly to a specific email account. If you/ your supervisor have confidentiality concerns, please submit a paper copy of your application to the Psychology Office instead of proceeding with the electronic submission.

FOR OFFICE USE ONLY – PLEASE HIGHLIGHT ANSWERS IN BOLD

Application No.:	PG049	Decision:	Approved	Date:	29.04.15
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RISK ASSESSMENT (complete relevant boxes):

Required:	Yes	Signed by:	Student	Supervisor	Programme Leader
Date:			12.04.15	12.04.15	28.04.15

LETTER/S OF ACCEPTANCE/PERMISSION MATCHING FRA1 (RISK ASSESSMENT) RECEIVED (SPECIFY):

	Date	From	Checked by	
All	28.12.14	Iran University of Medical Sciences	Supervisor	Ethics Admin
Part			Supervisor	Ethics Admin
Part			Supervisor	Ethics Admin

DBS Certificate(s) Required? (complete relevant boxes):

DBS certificate required?		Seen By:	
DBS Certificate Number:		Date DBS Issued:	

1 Summary of application (researcher to complete)

Title of Proposal:	Maternal-Fetal Attachment, Fetal Health Locus of Control and Maternal Health Practices amongst Iranian pregnant women who conceived via Assisted Reproductive Technologies and Naturally		
Submitted by:	Manijeh Pir Jalian		
Name of Principal Investigator/Supervisor	Director of study: Dr. Bahman Baluch Supervisor: Dr. Ilhan Raman		
Name of Student Researcher(s) and student number(s)	Manijeh Pir Jalian M00322166		
Proposed start date	1/06/2015	Proposed end date	1/12/2015
Details of any co-investigators (if applicable)			
Name: Dr. Masoud Reza Sohrabi	Organisation: Firoozgar Hosptial Tehran Iran	Tel: +98 2182141367 Fax: +98 2182141321	
Name:	Organisation:	Email:	
Name:	Organisation:	Email:	

Topic/Research Area (PLEASE HIGHLIGHT IN BOLD AS MANY AS APPLY)

Social/Psychosocial	Occupational	Forensic	Developmental	Health
Psychophysiological	Cognition & Emotion	Sport & Exercise	Psychoanalysis	Clinical

Methodology (PLEASE HIGHLIGHT IN BOLD AS MANY AS APPLY)

Qualitative	Field experiments	Observation (humans and non-humans)
Experimental	Questionnaire	Analysis of existing data sources / secondary data sources

PLEASE HIGHLIGHT ANSWERS IN BOLD

1.1	Are there any sensitive elements to this study? <i>If you are unclear about what this means in relation to your research please discuss with your Supervisor first</i>	Yes No
1.2	Does the study involve ANY of the following? <i>Clinical populations; Children (under 16 years); Vulnerable adults such as individuals with mental or physical health problems, prisoners, vulnerable elderly, young offenders; Political, ethnic or religious groups/minorities; Sexually explicit material / issues relating to sexuality; Mood induction; Deception</i>	Yes No
1.3	If the study involves any of the first three groups above, the researcher may need a DBS certificate (Criminal Records Check). PG students are expected to have DBS clearance. Does the current project require DBS clearance? <i>Discuss this matter with your supervisor if you unsure DBS is not required in IRAN</i>	Yes No
1.4	Is this a resubmission / amended application? <i>If so, you must attach the original application with the review decision and comments (you do not need to re-attach materials etc if the resubmission does not concern alterations to these). Please note that in the case of complex and voluminous applications, it is the responsibility of the applicant to identify the amended parts of the resubmission.</i>	Yes No

By submitting this form you confirm that:

- you are aware that any modifications to the design or method of the proposal will require resubmission;

- students will keep all materials, documents and data relating to this proposal until completion of your studies at Middlesex, in compliance with confidentiality guidelines (i.e., only you and your supervisor will be able to access the data);
- staff will keep all materials, documents and data relating to this proposal until the appropriate time after completion of the project, in compliance with confidentiality guidelines (i.e., only you and other members of your team will be able to access the data);
- students will provide all original paper and electronic data to the supervisor named on this form on completion of the research / dissertation submission;
- you have read and understood the British Psychological Society's *Code of Ethics and Conduct*, and *Code of Human Research Ethics*.

2 Ethical questions – all questions must be answered - PLEASE HIGHLIGHT ANSWERS IN BOLD

2.1	Will you inform participants of their right to withdraw from the research, without penalty?	Yes	No
2.2	Will you provide a full debriefing at the end of the data collection phase?	Yes	No
2.3	Will you be available to discuss the study with participants, if necessary, to monitor any negative effects or misconceptions?	Yes	No
2.4	Under the Data Protection Act, participant information is confidential unless otherwise agreed in advance. Will participant anonymity be guaranteed? (If yes, please explain how in your proposal; if no, explain why not in the box below)	Yes	No
2.5	Is this research or part of it going to be conducted in a language other than English? <i>Note, full translations of all non-English materials must be provided and attached to this document</i>	Yes	No
2.6	Is this research to be conducted only at Middlesex University? <i>If not, a completed Risk Assessment form - see Section 8 – must be completed, and permission from any hosting or collaborative institution must be obtained by letter or email, and appended to this document, before data collection can commence. If you are conducting an online survey or interviews via skype or telephone whilst you are at Middlesex University you do not need to fill in the risk assessment form.</i>	Yes	No

If you have answered 'No' to questions 2.1, 2.2, 2.3, 2.4, or 2.6 above, please justify/discuss this below, outlining the measures you have taken to ensure participants are being dealt with in an ethical way.

This research will be conducted entirely in Iran and by the applicant of this ethics application. The Iranian equivalent of DBS checking for data collection from vulnerable individuals is currently employed in Iran. The permission granted by the Iran University of Medical Sciences, Firoozgar Hospital (please see attached) is an indication that all checks have been done locally and approved that the applicant can conduct research.

The Risk Assessment form has been completed. The applicant is an Iranian citizen thus not affected by any visa restrictions or travel arrangements. However, there may be a delay in having the passport sent back from the Home Office thus as a backup plan Dr. M.R. Sohrabi from Firoozgar Hospital, Tehran, Iran has kindly agreed to assist in data collection and the administration of the questionnaires.

The letter from the Iran University of Medical Sciences, Firoozgar Hospital is attached, giving permission to collect the data for the study together with ~~also~~ the letter relating to Dr Sohrabi's assistance with questionnaire distribution.

Are there any ethical issues that concern you about this particular piece of research, not covered elsewhere on this form? If so please outline them below

All aspects of the study will follow strict ethical guidelines, in particular confidentiality, informed consent and debriefing.

Appendix D

Letters Granting Access to Subjects and Data Collection



Iran University of Medical Sciences
Faculty of Medicine

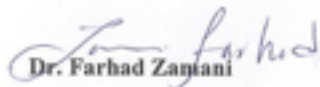


Firoozgar Hospital

Date: 10/06/2014

To whom it may concern

This is to confirm that Firoozgar Hospital approved the research on Assistant Reproductive technology: Social, Medical, Psychological and Educational Attitudes and Consequences by **Manijeh Pir Jalian**. The research is of interest to the medical and educational community and we are thus willing to give her all the assistance and permission required to conduct her research.


Dr. Farhad Zanjani

Dean of Firoozgar general Hospital



Firoozgar Hospital, Beh-Afarin St., Vahid Ave., Tehran, Iran
Tel: +98 21 82141367, Fax: +98 21 82141321
P.O.BOX: 1593748711
edofiroozgar@gmail.com



Iran University of Medical Sciences
Faculty of Medicine



Firoozgar Hospital

Date: 28/12/2014

To whom it may concern

This is to confirm that Firoozgar Hospital approved the research on “Exploring Maternal-Fetal Attachment and Fetal Health Locus of Control amongst Iranian Pregnant Women Conceived via Assisted Reproductive Technologies and Spontaneously” by **Manijeh Pir Jalian** Doctoral Researcher at Middlesex University.

The research is of interest to the medical community and we are thus willing to give her all the assistance and permission required to conduct her research.

Dr. Farhad Zamani

Dean of Firoozgar general Hospital



Firoozgar Hospital, Beh-Afarin St., Valiasr Ave., Tehran, Iran
Tel: +98 21 82141367, Fax: +98 21 82141321
P.O.BOX: 1593748711



Iran University of Medical Sciences
Faculty of Medicine



Firoozgar Hospital

Date: 7/Apr/2015

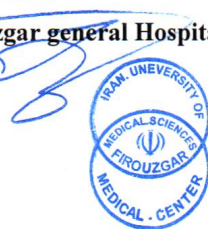
To whom it may concern

Manijeh pir jalian has been in touch with me asking for the possibility of a medical staff assisting in the administration and collection of questionnaires relating to her study. I can confirm that Dr Masoud Reza Sohrabi would be happy to assist with this request. Dr Masoud Reza Sohrabi is a full time member of our center and has been involved in various capacity including research conducted at this hospital.

Regards.

Dr. Farhad Zamani

Dean of Firoozgar general Hospital



Firoozgar Hospital, Beh-Afarin St., Valiasr Ave., Tehran, Iran
Tel: +98 21 82141367, Fax: +98 21 82141321
P.O.BOX: 1593748711

Appendix E

Publications and Presentations from this Thesis

Pir Jalian, M. (2020). What are the factors to consider in assisted reproductive technology? Psychreg. <https://www.psychreg.org/factors-to-consider-in-assisted-reproductive-technology/>

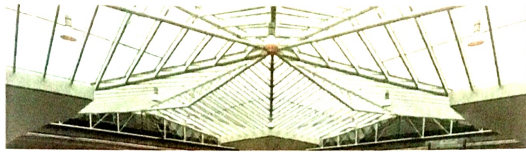
Pir Jalian, M. (2019). Conception by egg donation: Maternal-fetal bonding. Psychreg. <https://www.psychreg.org/maternal-fetal-bonding/>

Pir Jalian, M. (2018). Maternal-fetal attachment, fetal health locus of control and maternal health practices amongst women conceived through egg donation and naturally. *Society for Reproductive and Infant Psychology, 38th Annual Conference 2018, University of Lodz, Poland*. Poster presentation. 11th & 12th September 2018.

Pir Jalian, M. (2018). Conception by egg donation: Maternal attachment, locus of control and health practices. *British Psychological Society: Division of Health Psychology, Annual Conference 2018*. Poster presentation. 7th September 2018.

Pir Jalian, M. (2018). Maternal-fetal attachment, fetal health locus of control and maternal health practices amongst women conceived through egg donation and naturally. *Research Degree Student Conference 2018, Middlesex University, London, UK*. Poster Presentation. Won a prize for the best Poster Presentation. 4th September 2018.

Pir Jalian, M. (2017). A cross-cultural perspective on mothers' attitudes on sharing information with the teachers on which child has been conceived by egg donation. *Journal of Education and Practice*, 8 (27), 6-10. <http://eprints.mdx.ac.uk/22712/1/38920-42027-1-PB.pdf>



Poster Presentation

Presented to

Manijeh Pir Jalian

at

The Research Degree Student Conference 2018

Held on the 4th September 2018

Professor Richard Comley

(On behalf of the Organizing Committee)

Middlesex University, London

A Cross-cultural Perspective on Mothers' Attitudes on Sharing Information with the Teachers on Which Child Has Been Conceived by Egg Donation

Manijeh Pir Jalian, Doctoral Researcher, BA, MA, MSc
Middlesex University, School of Science and Technology, Department of Psychology, The Burroughs, The
Town Hall, London, NW4 4BT, UK.
Email: m.pirjalian@mdx.ac.uk

Abstract

There is now a growing body of research examining psychological aspects of children born as a result of Assisted Reproductive Technologies (ARTs), in particular via egg donation. Some research suggests that concealment of children's biological origins may affect their psychological development. Hence, there is current debate to decide how widely details about children's conception should be disclosed to the public in particular to those involved in the education of children. Some parents maintain that the school should be informed so that teachers can offer support to children that reveal details about their origin. Others think this information should be kept private. The present study is focused on the debate as to whether the private information about the children's conception should be shared with their teachers. This will be studied from the point of view of mothers with naturally conceived children and mothers of children born as a result of egg donation. Furthermore, the topic will be investigated from a cross-cultural perspective. Mothers of children born as a result of egg donation from Iran (N =4) and Britain (N =4), overall mean age = 39.37, and 69 mothers with naturally conceived children from Iran (N = 33) and Britain (N = 36), overall mean age = 36.79, were asked if they would agree that information about how their child was born should be shared with their teachers. The results were an overwhelming disagreement from all women that this information should be shared with teachers. However, Iranian women with naturally born children differed from their British counterparts in being relatively more positive on this subject, possibly an indication that they do not agree with conception via egg donation. The implications of the results are discussed.

Keywords: Cross-cultural, Children's conception, Egg Donation, Education

1. Introduction

Ever since the announcement of the birth of Louis Brown, the first test tube baby via In Vitro Fertilization (IVF) (Stephoe & Edwards, 1978) over 4.5 million children have been born through Assisted Reproductive Technologies (ARTs) (Golombok et al., 2013). The ARTs have now revolutionised the way people can create new families (Brezina & Zhao, 2012). The ART techniques separate conception from sexual intercourse and allow a third party involvement in the reproduction process, challenging traditional family identity (Dickens, 2002).

Common ART techniques include In Vitro Fertilization (IVF) in which the gametes (egg and sperm) are handled outside the human body with the aim of achieving a healthy conception (Human Fertilisation and Embryology Authority, 2014) and reproductive donation which includes donation of sperm (whereby the child lacks a genetic relationship with the father) and/or eggs (resulting in the absence of a genetic link with the mother). The key difference between IVF and IVF with egg donation being that when the mother's egg and father's sperm are used in IVF and the mother undergoes the pregnancy, the parents have both a genetic and gestational link to the child in the same way as parents of naturally conceived children, however, there is a lack of genetic link when only egg donation is involved (Golombok et al., 2013).

There has been a growing body of research aimed at examining psychological, social and educational consequences of ART conception on both families and children by comparing naturally born children with those born as a result IVF or egg donation (see for example, Koivurova et al., 2003; Bonduelle et al., 2005; Knoester et al., 2007; Knoester et al., 2008; Wagenaar et al., 2009; Golombok et al., 2009; Beydoun et al., 2010 and Zhan et al., 2013). The important issue to note here is that regardless of what difference scientists report between naturally born children and those born particularly as a result of egg donation, the question remains as to what the public regards about conception via egg donation (Golombok, et al., 2013; Donor Conception Network, 2017). One topic that has been debated, but not directly examined, is whether teachers (primary schools) should be informed of which child in their class has been born as a result of egg donation. There is currently an on-going debate about this issue. For example, one position maintains "sharing information with primary school teachers can be valuable so that they can support and back-up a child who talks about their beginnings in class" (Donor Conception Network, 2017). Others have highlighted that "teachers are now more sensitive to various family constellations, as well as the many different genetic and non-genetic ways families come together"

(Parent Via Egg Donation, 2017).

According to Golombok et al. (2011) most teachers are not aware of the nature of the child's conception. Hence, it is not clear what impact it may have on teachers if they know how the child was conceived. There is to date no reported study to examine the attitudes of mothers regarding whether teachers should be informed of which child in their class has been born by egg donation. Furthermore, the extent to which cultural differences may have an impact on the attitudes, particularly Western and Middle-Eastern, could shed further light on the latter issue.

The aim of the present study is thus in two-fold: First, to put the statement regarding whether teachers should be informed of which child was born as a result of egg donation to mothers of children with egg donation and mothers who have children born through natural pregnancy. Second, to look at the above from a cross-cultural perspective i.e. Iranian vs. British. As noted by researchers e.g. Greil, Slauson-Blevins and McQuillan (2010) cultural norms and values play a significant role in attitudes towards family values and having children by ART in particular through egg donation in the West and in a Middle-Eastern country like Iran.

2. Methodology

2.1 Design

A quasi-experimental questionnaire design in which the main independent variables are cultural differences and mothers with children born naturally and via egg donation. The dependent variable is the responses to the following statement "Teachers should be informed of which children in their class have been born by egg donation" based on Likert scale measurement.

2.2 The sample group

Mothers of children born as a result of egg donation from Iran (N =4) and Britain (N =4), overall mean age = 39.37, SD = 15.34, whose child is now in their early teens and 69 mothers with naturally conceived children from Iran (N = 33) and Britain (N = 36), overall mean age = 36.79, SD=15.22.

2.3 Data collection tools

The following statement was printed on an A4 paper "Teachers should be informed of which children in their class have been born by egg donation". Under the statement there was a four point Likert-type scale, ranging from 1 Strongly Agree; 2 Agree; 3 Disagree and 4 Strongly Disagree. Thus, the higher the score would imply stronger disagreement with the statement. There was also an additional space provided for any comments that respondents may wish to add about the reasons for their choice. Ethical approval was granted by Middlesex University and interviews were anonymous and no personally identifiable information was collected to ensure respondent confidentiality.

2.4 Collection of data and analysis

Data was collected in Iran and in the UK by author. The responses was recorded and subjected to statistical analysis. Furthermore, any additional comments made by the participants in response to the statement "Teachers should be informed of which children in their class have been born by egg donation": is listed below:

R-All children should be treated equally

R-Because our society is a traditional and religious country and it is likely that teachers may ignore these children

R-Nobody except parents should have this information

R-There is no difference between children no matter how they are born

R-It is not a concern for education

R-It is a personal matter

R-No reason to tell teachers

R-Unless it benefits the child

R-May needs research to decide whether children behave differently in the class depending on how they are born

3. Findings

The two figures below show Iranian and British responses to the statement "Teachers should be informed of which children in their class have been born by egg donation".

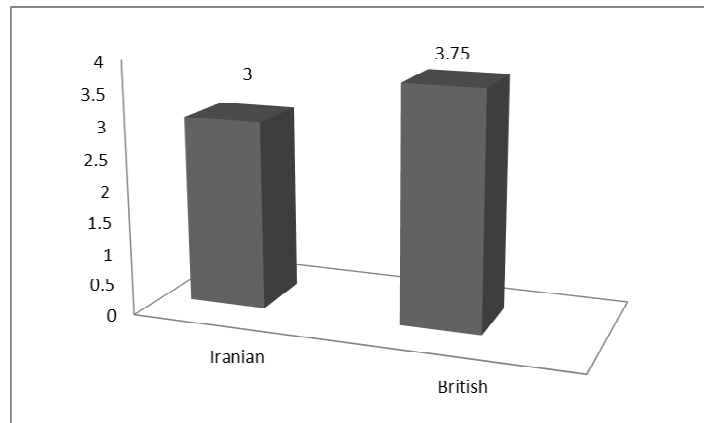


Figure 1. Responses of Iranian and British donor conceived mothers. Thus, the higher the score would imply stronger disagreement with the statement that which children in their class have been born by egg donation

Mean scores of response on the Likert scale on a scale from 1 = Strongly agree to 4 = Strongly disagree to the statement on whether teachers should be informed which child in their class is born via egg donation by Iranian (N = 4) and British (N = 4) donor conceived mothers

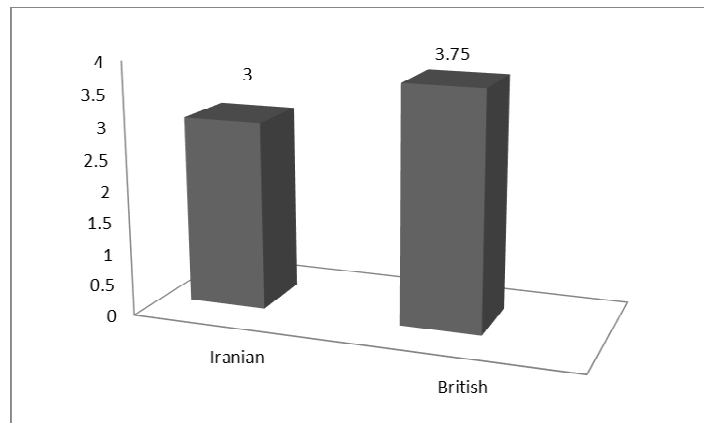


Figure 2. Responses of Iranian and British naturally conceived mothers. Thus, the higher the score would imply stronger disagreement with the statement that which children in their class have been born by egg donation.

Mean scores of responses on the Likert scale on a scale from 1 = Strongly agree to 4 = Strongly disagree to the statement on whether teachers should be informed which child in their class is born via egg donation by Iranian (N = 33) and British (N = 36) naturally conceived mothers

As can be seen in the above figures the general tendency for both cultural groups is towards disagree and strongly disagree part of the scale with an overall average of 3.3. A further point of interest, however, is that statistical analysis of data between Iranian and British mothers of naturally born children shows a significant difference with $t(67) = -3.38, p < 0.001$. This result indicating that British mothers disagree more strongly with sharing the information about the child's origin with the teachers than Iranian mothers.

4. Discussion

The key question pursued in this study was whether or not teachers should be informed of children in their class

born via egg donation from the perspective of Iranian and British mothers with children born by egg donation and naturally. The general consensus was more of disagreement to share this information with the teacher. Some of the main comments were that it is a private matter and something that is not relevant to the education of the child. However, what was of interest here was that the Iranian mothers with naturally born children were in comparison more keener that this information should be shared with the teachers compared to British mothers. The reason for this may be more rooted in the traditional religious country in which ART conceived children, particularly by egg donation, are still not so readily accepted (Abbasi-Shavazi et al., 2008; Tremayne, 2012). Thus, the negative feelings that mothers with naturally born children may have about conception by egg donation may reflect itself in their tendency for the information to be shared by teachers.

There is, however, another side of this debate on whether teachers should have knowledge of which child was born as a result of egg donation. The current on-going research on psychological, medical and social consequences of ART born children (via IVF or egg donation) is still not conclusive. For example, research indicates that children born as a result of IVF may be more hyperactive (Beydoun et al., 2010), are more likely to be expelled from school (Zhan et al., 2013) may be more socially withdrawn (Wagenaar et al., 2009) and may have a lower IQ score (Zhan et al., 2013). There is in comparison less research on consequences of egg donation mainly in view of the reluctance of parents to take part (see e.g. Golombok et al., 2013). The overall consensus is that the general public is less knowledgeable or feel less positive about egg donation compared to other forms of ART conception (see Hudson et al, 2009). This issue brings to mind the famously known "Pygmalion in the classroom" (Rosenthal & Jacobson, 1968). The study came to the conclusion that teachers may behave differently towards pupils who they believe to be low achievers. Thus, the question here is whether teachers may have the same attitude towards children born by egg donation. Indeed, if in a society (such as Iran) there is not a very positive attitude towards children born as a result of egg donation, or the scientific research regarding the consequences of such conception is not conclusive, this may affect those involved in the education of the children. Thus, whether teachers should be given information about which children's conception is via egg donation should be subject to more research and scrutiny by all parties involved.

Future research should focus on the actual teacher's attitudes about children born as a result of egg donation. This is because their positive or negative attitudes may affect the way they interact with the children in their classroom.

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