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Title: To freeze or not to freeze embryos: clarity, confusion and conflict.

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Abstract

Although embryo freezing is a routine clinical practice, there is little contemporary evidence on how couples actually make the decision to freeze their surplus embryos, or of their perceptions during that time. This study explores this neglected area. This is a qualitative study of 16 couples who have had IVF treatment. The study question was: “What are the personal and social factors that patients consider when deciding whether to freeze embryos?” The study shows that while the desire for a baby is the dominant drive when contemplating whether to freeze embryos, couples’ views revealed more nuanced and complex considerations in the decision making process. It was clear that the desire to have a baby influenced couples’ decision-making and that they saw freezing as “part of the process”. There were confusions associated with the term “freezing” related to concerns about the safety of the procedure. Despite being given written information, couples were confused about the practical aspects of embryo freezing, which suggests that couples were preoccupied with the immediate demands of IVF. Couples expressed ethical conflicts about freezing “babies”. Findings from this study will inform clinicians and assist them in providing support to couples confronted with the difficult decision-making.
Introduction

Cryopreservation of surplus embryos is a standard practice in most IVF units. According to HFEA data, there were 8,959 cycles using frozen-thawed embryos in 2008 in the U.K (Human Fertilisation and Embryology Authority, 2011), which increased to 10,548 cycles in 2010, resulting in 2,032 live births from the frozen-thawed embryo cycles in 2010 (Human Fertilisation and Embryology Authority, 2012). The benefits of freezing good quality surplus embryos following fresh embryo transfer include the replacement of the thawed embryos on several different frozen embryo transfer cycles (FET) using the stored embryos. This potentially maximises the use of a single egg collection procedure in IVF in terms of transferring embryos on multiple occasions (Trounson and Mohr, 1983). It also eliminates the need for repeated ovarian stimulation and egg collection procedures, and the associated risks, but still gives women another opportunity to have a baby. Furthermore, it gives every good-quality embryo a chance to develop into a baby, rather than being discarded. Whilst these arguments are legitimate, they also smooth over the complex decision making by the couples involved, especially in view of the contentious ethical nature of this practice.

The moral status of the elusive entity, ‘the embryo’, has been extensively debated in the literature (Haimes and Luce, 2006; Waldby and Squier, 2003). It is argued that the practice of freezing embryos can be associated with various ethical dilemmas, such as the paradox of freezing life (Lyerly, et al., 2006; Parry, 2003).
Qualitative research has demonstrated that IVF couples can have a range of views regarding their frozen embryos. Some perceive their frozen embryos as no different from “virtual children whose development was suspended”, as described by de Lacey (2007) and interviewees have described them as their “babies” (de Lacey, 2005; de Lacey, 2007; Haines, et al., 2008; Nachtigall, et al., 2005; Parry, 2006; Söderström-Anttila, et al., 2001; Svanberg, et al., 2001; Svendsen and Koch, 2008). To many individuals, frozen embryos are siblings to their existing children (Nachtigall, et al., 2005), whereas some see the embryos as ‘seeds’ (de Lacey, 2007). On the other hand, others perceive the frozen embryos as “inanimate tissue” or “a bunch of cells” (Fuscaldo, et al., 2007).

There are suggestions that couples perceive freezing embryos as establishing an “insurance policy” for the future, as “backup” embryos in case current IVF treatment fails, or in the situation of anything happening to their existing children (Bankowski, et al., 2005; Koryntova, et al., 2001; Stoleru, et al., 1997). In the sparse evidence that is available, couples have cited the following reasons for embryo freezing: providing security and hopefulness (Lyerly, et al., 2006; Nachtigall, et al., 2009; Svanberg, et al., 2001), reducing stress (Bankowski, et al., 2005; Koryntova, et al., 2001; Stoleru, et al., 1997) and “buying time” (Haines and Taylor, 2009). There is some evidence that a few couples are sceptical about embryo freezing because of concerns regarding the health of the potential children (Svanberg, et al., 2001) and worries about laboratories mishandling embryos (Bankowski, et al., 2005).
Most previous studies report the attitudes of patients whose embryos have already been frozen. Little is known about their actual decision-making process about freezing which occurs at one of the most stressful times during the IVF treatment process. At this stage the embryo cohort includes those of differing potential and the decision on freezing needs to be made within a short time period. Furthermore the outcome of treatment is unknown. To help them through this stage, it is relevant to understand how patients perceive their embryos at this time and how they make decisions. This paper reports the second part of a larger two part post-graduate study, which examined two related aspects: first, an evaluation of the influence of embryo freezing on in vitro fertilization (IVF) success rates and second, an exploration of the decision-making process through which couples decide whether or not to freeze any surplus embryos. The findings of first part of the study showed a modest increase in the overall cumulative pregnancy rates following embryo freezing (Goswami, et al, 2013). The aim of the second part of the study was to bridge the gap in the literature on how couples make decisions about embryo freezing by interviewing couples just after they have completed an IVF treatment. The aim was to provide information for clinicians so that they can better assist couples confronted with difficult decision making. The central research question for this part of the study was: ‘What are the personal and social factors that patients consider when deciding about freezing embryos?’ This paper outlines the various issues which emerged from this exploration.
Materials and Methods

This study was conducted in a tertiary care centre in the north-east of England, following appropriate approval from the Newcastle and North Tyneside Local Research Ethics committee. Due to the scarcity of evidence in the literature, a hypothesis generating, rather than hypothesis testing, research design was adopted. One possibility was to conduct “purposive or systematic sampling”, which involves the deliberate, theoretically led choice of respondents (Pope and Mays, 1995), but due to the lack of previous evidence, “heterogeneity sampling” was conducted, where the categories of sampling were tentative to allow for the widest variation in responses and with the goal of reaching thematic saturation (Silverman, 2001). The aim was to recruit couples who had just been through at least one IVF treatment, and who thus had had to consider the prospect of freezing embryos, interviewing them while the process of IVF was still a “live”, active issue in their minds. However, a limitation of this study was that it failed to capture the perceptions of certain groups of couples, for example those with strong reservations against embryo freezing, or those with existing children, which could potentially have influenced their views on this issue. Two hundred letters were sent to couples attending the clinics following IVF treatments, as well as those attending ultrasound scans to confirm pregnancy. Sixteen couples expressed interest in participating in the research, comprising couples who were successful as well as unsuccessful following the preceding treatment. The response rate was in keeping with the experience from other qualitative research experience at this centre. After obtaining informed consent, qualitative
Interviews were conducted with a semi-structured questionnaire informed by issues identified from the literature. Interviews encompassed the couples’ demographic details and fertility history, their views on frozen embryos and embryo freezing, their views on any benefits from, and any concerns about, embryo freezing, their experiences of freezing if applicable, and the information they received about embryo freezing. Each interview lasted between 60 and 90 minutes. Both partners were encouraged to participate in the interview and express their views without any inhibitions. All the participants seemed to have a sufficient understanding and command of English. The interview was “semi-structured”, with an open-ended approach and the aide-memoire was only used from time to time to guide the interview. New ideas emerging from the early interviews were introduced in subsequent interviews in order to compare and elicit similarities, dissimilarities, or contrasting views of different individuals, and the nuances of the emerging themes. There were no new themes emerging towards the later interviews, implying that thematic saturation of data was achieved.

The interviews were transcribed and thematic analysis was performed, based on identifying similarities, dissimilarities, conflicts, variations and ambiguities of the responses, using the “constant comparison” technique. Possible relationships in the data were identified and several hypotheses were derived, using ‘inductive theorizing’. Analysis of “deviant” or negative cases (that is, cases which seem to contradict the emergent themes) was also performed (Pope, et al., 2000; Silverman, 2001).
Results

Sixteen interviews were conducted: 5 couples had frozen embryos and 11 couples did not, owing to a lack of suitable embryos to freeze. The broad categories that emerged from the thematic analysis were as follows: the context of couples’ infertility experiences; their fertility treatment history; their views of the frozen embryo; their views regarding the perceived benefits and difficulties of embryo freezing; financial factors influencing their decision on embryo freezing; information that the couples obtained about embryo freezing; couples’ experiences of making the decision to freeze their embryos, and their views of the clinic professionals. Salient features from these themes which are relevant to clinicians and practitioners in understanding the perspectives of couples, and potentially useful in providing support to the couples, are discussed below.

Essentially, all the couples, given the opportunity, were in favour of freezing their embryos, to maximise the chances of having a baby. Nonetheless, their decision making was nuanced; various facets of their concerns, reservations, views, expectations are presented here.

The context of infertility and the IVF experience

The key driver for couples embarking on IVF treatment was the desire to have a baby. The NHS (National Health Service) funds a maximum of 3 IVF treatments so couples were aware of their limited chances of having a baby. The strong desire to maximise their opportunity to have a baby through embryo cryopreservation was voiced by this interviewee: “I think the more treatment cycles that we did, the more it probably would have ... affected [our decision to
freeze embryos]. Her partner agreed: “... yeah, I agree... by the time we got to number three ... it would have been last chance saloon” (I7:1685–1740). They felt pressured by the limitations on the number of funded treatment cycles and this pressure, both emotional and physical, increased in successive treatments, impacting directly on their decision about embryo freezing. An interesting finding in this study was how the framing of IVF treatment changed over time and influenced the views of many couples, who changed from seeing embryo freezing as ‘freezing life’ to perceiving it as a “medical aid” or a tool to achieve a pregnancy. The following couple initially had ethical reservations about the process, but changed their view: “... what made us change our mind ... on the issue was ... having had the experience of IVF ... [it] put things into perspective” (I1: 273–290). The male partner later continued: “... we came to view IVF and even the freezing part just as a ‘medical aid’ ... to someone who can’t really naturally have babies” (I1: 927-960).

Conceptualising the frozen embryo

The way the couples envisaged embryos, for example as a ‘living entity’ or a ‘baby’, or as ‘tissue’, underpinned their decision-making process. Couples who saw embryos as “babies” also saw frozen embryos as babies; the “frozen” prefix did not alter their opinion. The following interviewee perceived his frozen embryos as: “Just my babies in waiting ... waiting to get a place to grow ... so I don’t think the word “frozen” really matters in that context” (I11:844–861).
There were also couples who were not quite comfortable with the paradoxical concept of freezing their babies, as this interviewee expressed: “I would be thinking: I’ve frozen my kids. (Laughs) ...and I don’t think I would like that very much, to be honest ... they could turn into children and we’ve actually got them frozen” (I8:975–1013).

Uncertainties about the concept of the embryo emerged from the interviews. The interviewees’ deliberations showed how their conceptualisation of the embryo changed over different phases of the IVF treatment, reflecting the dynamic nature of the concept of the embryo. One interviewee commented: “To me, when I’ve got sort of rational, sensible head on ... it’s cells. When I’m on the Menopur [laughs] ... and hormones are kicking in ... then it becomes, I think, a life” (I4:1632–1677). The couples, although not easily able to articulate and characterize their concepts of the frozen embryos, were not paralysed by the uncertainty of the conceptualization. Instead, in their deliberations, the couples acknowledged the uncertainty of what the embryo is, but this confusion did not dissuade them from going ahead in their journey through IVF treatment; they moved on in the pursuit of having a baby.

Regardless of the initial framing of their conceptualisation of frozen embryos, many couples came to perceive the process of creating or freezing embryos as a scientific exercise. One interviewee commented: “it’s just part of the process (I4:1881–1893) ... it’s a means to an end, isn’t it?” (I4:2601–2614). This deliberation further demonstrates the metamorphosis of couples’ views in seeing
the embryos, and seeing freezing as a ‘medical aid’ to achieve the goal for a baby, rather than as a ‘life’. Rather than seeing the embryo as the beginning of a baby, which could potentially lead to ethical and moral dilemmas when considering freezing, couples started to view the frozen embryo in a more instrumental fashion, as part of the IVF process, towards the ultimate goal of having a baby. Thus, freezing is viewed as a means to an end, as just another step towards achieving their ultimate objective. This change in view seems to suggest a “transformation” in the IVF journey. Conceptualising the embryo as a scientific or medicalised entity enabled them to overcome their moral dilemma and sense of guilt regarding freezing ‘life’. This transformation allowed them to maximise their opportunities of being a parent on one hand, and overcoming any ethical reservations on the other.

**Views on embryo freezing**

Couples’ views on the benefits or concerns regarding embryo freezing were as follows:

**i. Extra chance**

The experiences of going through IVF treatment, and its many uncertainties, taught interviewees to value embryo freezing more than they had when setting out on IVF, as is captured in this interview: “… *having been through the process, I very strongly believe that you need to maximise your chances now as I very strongly believe that you should freeze embryos if you get the opportunity…*” (I7: 1741–1772).
An appreciation of the extra chance of having a baby from frozen embryos propelled the decision-making of the majority of the interviewees; some described it as a “bonus”: “... you only have a limited number of goes on the NHS and by freezing embryos you potentially circumvent that a little bit ...” (I7: 953–973). There was also a sense of freedom in being able to extend the chances of pregnancy beyond the regulated three NHS-funded treatments.

**ii. Control and ownership**

To some couples, embryo freezing was their opportunity to exercise autonomy in deciding the fates of the embryos they ‘owned’. This interviewee mentioned:

“... so if I wasn’t allowed to freeze them, I would have a lot of problem with that – not knowing what was going to happen to them ... then I’ve lost control of that decision erm and because they’re my embryos ... so surely it’s for us to make that decision as to what happens to them ...” (I9:677–752). This deliberation testified that embryo freezing can reinforce the feeling of being in control in couples who seem to be suffering from a feeling of lack of control, due to their subfertility. It also helps them to exercise their autonomy regarding the fate of “their” embryos, which couples distinctly see as belonging to them.

**iii. Insurance Policy**

When the concept of embryo freezing as an insurance policy, as cited in the literature, was introduced to the interviewees, there was a polarized response, with some supporting and others refuting it on ethical and other grounds. The
following interviewee said in support: “If this (fresh IVF treatment) doesn’t work – you fall back on your insurance policy, isn’t it?” (I7X:948–978).

However, another interviewee disapproved of the term, not only because it failed to respect the emotions and aspirations of the couples, but also because it had business and financial connotations. In her view, the term was a misnomer, as there was no reimbursement, as there would be with an insurance policy: “… that kind of terminology to me shows a lack of understanding about why people go through this … it sounds like the kind of business decision. So the terminology kind of doesn’t fit really … an insurance policy… when this one goes wrong it’s an immediate swap and an immediate replacement which obviously … it isn’t really for this kind of process” (I7:849–905).

Freezing embryos was seen by many as being a “backup”, in case of failure of the fresh cycle. As one interviewee said: … if something went wrong or if … we suddenly changed our minds in the future and thought: let’s give it one more go – there is that back up.” (I4:740–752). She carried on: “Again it’s like I suppose what you call belt and braces – isn’t it …” (I4:1375–1402).

iv. Concerns

A few individuals had reservations about any potential harm to embryos from freezing, as there is uncertainty surrounding the fate of frozen embryos. One interviewee deliberated: “… I think somehow morally it’s not right. Because … what happens if those embryos are not placed in a womb where they can grow and become babies? What happens with them?” (I1:418–437). He had mentioned
earlier on: “... Because we wouldn’t like any spare embryos just left somewhere waiting in limbo” (I1:384–386).

Many interviewees worried about the safety of the process, and any ill effects on the health of the resultant offspring. The association with freezing food was a common theme and added to their concern. One interviewee commented: “It sounded a little bit scary I guess.” (I12:253–267). She continued: “... I know it’s not done in the same way but if you put something in your freezer and it’s not wrapped up properly you get freezer burn and therefore it’s useless afterwards...

...you hear about it (embryos) stored for a number of years; well you don’t store things like food for a number of years” (I12:359–379).

Other key factors influencing couples’ decision making

i. Funding issues

A key finding in this study was that financial issues had a major impact on the decision-making on embryo freezing. The majority of the couples appreciated the NHS funding for embryo freezing and found the 12 months funded storage period to be of huge benefit, especially in view of the economic climate. One interviewee commented: “it (NHS funding) gives you a chance to move on and research and make your decisions. ...it gives you a window of time. I think you need to keep that... if there was a financial penalty from day one I think it would put a lot more people in a lot more stressful position” (I5:1372-1421).

The decision to freeze surplus embryos for the future became almost automatic in the presence of NHS funding, which appears to relieve some of the burden of
decision-making. For example, one couple said with reference to NHS funding, 

‘... I think we would just very instinctively have them (frozen)...there wouldn’t be much thinking” (I6:672-721). He later said: ‘’Yeah, it’s a no brainer” (I6:1196-1205).

However, for those couples funding their treatment privately, the decision-making was more carefully thought out; the potential expenses of freezing and storing embryos, and then having a frozen-thaw cycle were calculated against the cost of a fresh IVF cycle. One interviewee said, “so you freeze it, keep it for years and defrost it and it doesn’t survive...what’s the point? You could have saved that money... There’s half your money towards your full IVF treatment so you might get a better chance” (I9:1451-1566).

On the other hand, for some private fee paying couples, the positive aspects of a frozen cycle, such as shorter treatment duration, less invasive treatment, and lower fees compared to those for a fresh cycle, almost counterbalanced the negative considerations of, for example, reduced success from frozen embryos. One interviewee commented: “I don’t see that that extra ten per cent lower (success rate) is going to make any difference. And it’s almost counter balanced by the fact that the frozen cycle is so much less intrusive ... and there’s less trips back here for scans and ... that I’m paying less (in frozen cycle, compared to the fresh)so yes, the success rates aren’t that good but the other part of it is actually much easier” (I9:1607–1639).
All couples embarking on IVF treatment were given detailed written and spoken information about IVF, including embryo freezing. However, at the beginning of treatment, freezing embryos was a secondary issue, as couples were preoccupied with their immediate treatment, the complexity of which demanded intense attention, especially in the first cycle. This is reflected in this interviewee’s comment: “We’ve never, honestly, all the way through we’ve never really thought about embryo freezing….what implications that will have …because we were just taking one step at a time. We weren’t thinking about (it) too much because it was so much to take on board at the time … So anxious [about] getting to the next stage” (I2:236–334).

A few couples, especially the ones who did not have any embryos to freeze, had little or poor quality recollection about the freezing information. For example, one couple had no idea that the frozen cycle could provide extra treatment in addition to the three NHS-funded cycles. The woman, who had been through two IVF cycles, seemed surprised: “… So that (frozen-thaw cycle) wouldn’t class as a third go? Her partner added: I didn’t know that. Well of course, it makes sense now – doesn’t it?” (I4: 760–842).

Appreciating the huge volume of information, the following interviewee advocated a separate session to discuss embryo freezing “… I think … you’d need a separate appointment about freezing embryos and you’d really need to go
through that whole decision. I think it would add a lot of info, for you to consider”

(I11:1490–1546).

Couples deciding to freeze embryos often wanted information related to the wellbeing of the future offspring. For example, several weighed any potential harm to the offspring on the one hand, against the benefits of the procedure on the other, before making the decision to freeze. The following interviewee viewed the overwhelming desire to have a baby even at the risk of compromising the health of the offspring through freezing, as “selfishness”: “We asked the questions: what are the facts? I’d be wanting to know more about the risk factor” (I5: 1538–1571). He carried on: “… because obviously I wouldn’t want to bring a child into the world who was so severely disabled due to a factor that I wanted a baby so much that I was going to put their lives in such a lot of trauma … because of my selfishness” (I5:1572–1603).

The decision

The verdict from all the interviewees was that, given the opportunity, all would freeze their embryos. One interview said: “…Yeah, definitely. I don’t think I would think twice about it (embryo freezing) if the opportunity’s there.” (I14:498–508).

Nonetheless, it is clear from the preceding sections that their decision making was nuanced and complex, as further indicated by the following interviewee. She was pregnant from the fresh cycle, and in retrospect was relieved not to have any frozen embryos. However, in view of the benefits of embryo freezing, she was not
certain about her decision in any future IVF cycle. She said: “... I’m pleased we didn’t have that opportunity (to freeze embryos) (laughs) because it would have really messed with my mind. ... I know it’s an extra chance and y’know if I had to go through this again and we got the choice to have them frozen I probably would have them frozen erm but hopefully – I don’t know” (I8:1219–1241). It is a key finding of this study that some couples experienced relief at having no frozen embryos after achieving a pregnancy, and hence were able to avoid any ethical dilemma. This suggests that couples might make an ethical compromise by freezing embryos as a result of their desire to have a baby.

**Discussion**

Contrary to other studies of couples with frozen embryos, where the embryos had already been frozen for a period of time, this study focuses on a different point in the IVF process. In these situations, couples’ conceptualisation of frozen embryos can change with time. This was evident in the situation that the Swiss couples experienced (Scully, et al., 2010), with changing legislation in the country with the introduction of the new law on stem cell research (LSCR) in 2004 (Scully and Rehmann-Sutter, 2006). The couples had had their embryos frozen from prior to 2001, and with the new legislation, were faced with the options of either discarding their unused embryos or donating them to stem cell research. These couples distinguished the frozen embryos from “babies”; the emotional attachment to these embryos seemed to have disappeared, and these were perceived by the couples as belonging to the biomedical domain. Thus, the “embryo” can have different meanings to individuals in different socio-cultural
time and space (Haimes, et al., 2008). However, in the study reported here, couples were interviewed just following their IVF treatment, and they had just confronted the option of whether or not to freeze any surplus embryos, so this decision was very likely to have been influenced by their conceptualisation of the embryos at this point in time.

The key findings of this study were as follows:

1. Couples do not regard embryo freezing as an obvious or straightforward decision.

All the couples, regardless of whether they had the opportunity to freeze their embryos or not, were eventually in favour of freezing embryos to maximise their chances of having a baby. While for some couples, it was a “common sense”, “straightforward”, decision, this was in light of the uncertainties of the IVF context. Other couples when reflecting on the IVF process articulated their considerations in greater detail, having considered the various pros and cons of embryo freezing, such as: the success rate from frozen embryos, the alternative options available for disposal of the surplus embryos, and the risks versus the benefits of freezing their embryos. This decision was impacted by the limitations on the number of funded treatments, and the experience of the physical and emotional tensions of the treatment. Therefore, prospective thinking about the possibility of embryo freezing shows that it can be a nuanced and complex decision to make.
2. The desire for a baby overcomes all ethical concerns about embryo freezing.

Couples experience tension between the morality of freezing and their own increasing vulnerability and stress. The key factor in generating ethical reservations was the dilemma of ‘freezing babies’. For a few couples it was ethically acceptable to freeze embryos, as the embryo cannot be compared to an individual, since it cannot survive independently if not transferred into the uterus under congenial circumstances. However, for most couples experiencing difficulty eventually the desire for a baby overcame all ethical considerations; it is this tension that might have led to their coming to view embryo freezing as instrumental to their needs/objectives.

3. IVF couples transform their views on embryo freezing to overcome any reservations.

As discussed, developing views on embryo and embryo freezing enabled couples to come to terms with the moral dilemma of freezing, the desire for a baby and their own vulnerabilities. Given that embryo freezing is routinely incorporated into IVF/ICSI treatment processes and is thereby normalised discursively, the couples’ view of it as a medicalised process can seem very natural. This transition of the embryos in the perception of IVF couples into a ‘utilitarian’ role is a unique finding of this study. The experiences of the journey of IVF as if lead the couples to unravel the numerous layers of the conceptualities of the ‘embryo’ at different stages of the process. On reaching the stage when confronted with
the decision to freeze or not to freeze, there is metamorphosis of their views to see the ‘embryo’ as a medical instrument, which could just be another scientific aid to help them to achieve their goal.

4. Embryo freezing imparts a sense of being ‘in control’ or ‘autonomy’ to the couples.

The suggestion that embryo freezing reinforces the couples’ sense of control reflects findings of a past study where interviewees perceived benefits from embryo freezing, as it prevented “relinquishing control”, and allowed them to determine the fate of their embryos (Nachtigall et al., 2009).

5. Does NHS funding for embryo freezing override the ethical issues in the decision making process?

Funding for embryo freezing, whether NHS funded freezing, or private financial investment, seemed to have a significant influence on the decision making. The question arises whether the automatic availability of NHS funding for embryo freezing overrides the ethical or other considerations of the decision making. Conversely, for those who need to pay for freezing privately, the financial implications and ethical considerations may have equal weight in the decision. If there is concern that NHS funding over-rides ethical considerations, the option of NHS-funded fresh IVF treatment without embryo freezing could be considered although this would be contrary to the principles of the NHS and the NICE recommendations (National Institute for Health and Clinical Excellence, 2013).

Levying a tariff on embryo freezing could mean that more weight and critical
thought is given by couples to the embryo freezing decision, rather than making it a routine exercise available for free. This could, however, simply exacerbate inequality amongst IVF couples. On the other hand, it is possible that underlying the seemingly easy decision for freezing with the availability of the NHS funding lay the difficult dilemma and hidden moral quests of many couples, regarding this decision making. In this context, surely the status of an ‘embryo’ has a significant role to play, as any finance related decision would have a totally different dimension to it, if the embryo was the same as a child. Further in depth research in this area would help in exploring the dilemma of couples in this regard.

6. More information regarding embryo freezing may not influence the decision made by couples.

Many couples were not able to recollect information regarding the practical aspects of embryo freezing: its safety; success rates; freeze-thaw regulations; duration of NHS funding for freezing, despite receiving detailed clear verbal and written information. This could be because most couples found the information overwhelming and were preoccupied with the complexities of going through IVF especially the first cycle, when embryo freezing did not seem to be the focus (Carroll and Waldby, 2012; Haimes and Taylor, 2009; Haimes and Taylor, 2011).

Therefore the question arises as to what then is the most appropriate time to give couples detailed information regarding embryo freezing? There could be two options. First, organizing a separate information session to discuss the different
issues about embryo freezing at the beginning of the IVF treatment, although
with associated logistic and cost implications, and the risk of unnecessary
information overload. The second option would be to hold a debriefing session for
the couples at the end of the IVF treatment, where the issue of embryo freezing
would be revisited in detail. This could give couples the opportunity to reflect
and make informed decision for the future, and also would facilitate interaction
with others and the exchange of views.

A further recommendation to fertility clinics based on the emergent data would
include clinics taking the initiative in facilitating discussion and communication
among patients e.g. developing a Web-based forum as a platform for patients to
share information, views and experiences. Nonetheless, the big question
remains whether the provision of further detailed information would make any
difference to couples’ decision making, as the dominant desire to maximise the
chances to have a baby has been shown to override all other issues.

Clarity, confusion, and conflict: issues for further study.

From analysing the repertoire of couples’ considerations, certain key areas of
clarity, confusion and conflict were manifest in the couples’ decision on whether
to freeze embryos. The main issue clear in the mind of all the couples, and the
key factor connecting all the themes, was the desire for a baby being the
dominant drive for freezing embryos. Despite having various concerns, given the
chance, all couples, including those who did not have the opportunity to consider
this option in the last cycle, would freeze their embryos to maximise the opportunities to have a baby.

There were a few issues which confused couples. The embryo seemed to be an enigmatic entity, whose nature couples struggled to comprehend, and they vacillated from one view to another. Couples who initially envisaged the embryo as a living object, shifted their conceptualisation to seeing the embryo as a “cell”, or as objects generated as “part of the process” of IVF treatment. The embryo thus has a dynamic conceptualisation, which fluctuated with the various stages of circumstances and treatment of the couples. The subtleties in the nuanced views of the embryo emerged from this study, as in previous studies (Bankowski, et al., 2005; Boada, et al., 2003; Haimes, et al., 2008; Svanberg, et al., 2001), along with the view that the meanings attributed to the embryo shifted over the different stages of the IVF process (Haimes, et al, 2008).

The confusion experienced due to the potential overloading of information has been discussed.

The major conflict, as discussed was the moral conflict of ‘freezing babies’. Another conflict was in perceiving embryo freezing as an “insurance policy”, although it was frequently perceived as a backup in case of an unsuccessful fresh cycles. Although in essence conveying a similar perception, many interviewees had moral objections to the term “insurance policy”, when quoted, as a term used by researchers in previous studies (Bankowski, et al., 2005; Koryntova, et al.,
The disapproval of the term “insurance policy” could be because of the implied association between babies and money.

**Strengths and weaknesses of the study**

The main strength of this study is that it sheds light on areas that are deficient in the literature, with regards to the actual decision-making process behind embryo freezing, and the personal and social factors influencing that decision. A good kernel of original data has emerged from these interviews, which can form the basis of further in-depth research and follow up studies.

The authors accept that not all aspects of embryo freezing were covered in this study, such as the views of those who strongly decline embryo freezing, the views of those couples who already have a baby, or opinions of women in the older age group. Also, no relationships with religion, education, profession and ethnicity have been captured in this study, and further work needs to be done to explore these areas.

**Conclusion**

This study is a maiden attempt to explore the perceptions of IVF couples when confronting the nuanced and complex decision making of whether or not to freeze their embryos. The clarity, confusions and conflicts of couples during the process have been captured, and the findings would help clinicians provide better support to couples. Accepting the few limitations of this study, the framework of data generated can potentially guide future work for further in-depth study to
elicit more ideas of couples’ views, as well as provide opportunities to test these hypotheses.

Authors’ Roles

M.Goswami co-designed and implemented the study design, conducted the interviews, analysed and interpreted the results, and drafted the article.

A.P. Murdoch had overall responsible for the post-graduate study of which this work was one part and was involved in co-design, analysis and interpretation of the data, revising the article critically for intellectual content, and in final approval of the version to be published.

E. Haimes co-designed the study, provided support for the analysis and interpretation of the data, revising the article critically for intellectual content, and in final approval of the version to be published.

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Declaration of interest

The authors report no conflicts of interest. The authors are responsible for the content and writing of the paper.
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