Marital Stability and Quality in Families Created by Assisted Reproductive Technologies: A Follow-up Study

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Abstract

An increasing number of children are being born with the use of assisted reproductive techniques (ARTs) such as donor insemination, egg donation and surrogacy. There have been concerns that the use of these third-party reproductive techniques may have a negative effect the quality of the relationship between the mother and father. Marital stability and quality was examined in a UK sample of donor insemination, egg donation, and surrogacy families and families in which children were naturally conceived. Interview and questionnaire assessments of marital stability and quality were collected from mothers and fathers over five time-points, when the children in the families were aged 1, 2, 3, 7 and 10. Of those families who participated when children were 10 years old, a minority of couples in each family type had divorced/separated and few differences emerged between the different family types in terms of mothers’ or fathers’ marital quality. Despite concerns, couples in families created by donor insemination, egg donation and surrogacy were found to be functioning well.

Key words: donor insemination; egg donation; surrogacy; family functioning; marital stability; marital quality.
Summary

An increasing number of children are being born with the use of assisted reproductive technologies (ARTs) such as donor insemination, egg donation and surrogacy. There have been concerns that the use of these ARTs may have a negative effect the quality of the relationship between the mother and father. Marital stability and quality was examined in UK a sample of donor insemination, egg donation, and surrogacy families and families in which children were naturally conceived. Interview and questionnaire assessments of marital stability and quality were collected from mothers and fathers over five time-points, when the children in the families were aged 1, 2, 3, 7 and 10. Of those families who participated when children were 10 years old, a minority of couples in each family type had divorced/separated and few differences emerged between the different family types in terms of mothers’ or fathers’ marital quality. Despite concerns, couples in families created by donor insemination, egg donation and surrogacy were found to be functioning well.

Introduction

Couples who are unable to conceive naturally and who wish to experience pregnancy, birth and raising their child from birth may to turn assisted reproductive techniques (ARTs). In cases where techniques such as in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI) are inappropriate or unsuccessful, couples may use third-party reproductive techniques, such as donor insemination, egg donation and surrogacy. The involvement of a third-party in reproduction has raised a number of concerns. Historically, this has been seen as undesirable due to fears that this would disturb the relationship between the mother and the father (Warnock, 1984). Additionally, there have been concerns that the imbalance in parents’ genetic relatedness to the child may have a negative effect on the marital relationship (Edelmann 1989). Unlike couples who conceive naturally, couples who have used third-party reproduction have had to accept
that they are unable to experience the pregnancy and birth of a child who is their shared genetic offspring, which may have involved feelings of grief and loss (Hammer Burns & Covington 2006).

The quality of the marital relationship has important implications for family functioning in general. Studies utilising observational measures have found that higher levels of affection in the marital relationship are associated with higher levels of affection in the parent-child relationship (Fauchier & Margolin 2004). These findings provide evidence for the “spillover hypothesis”, in which mood, affect or behaviour are considered to be transferred from one setting to another (Erel & Burman., 1995). Marital quality has also been found to be related to child adjustment. For example, the frequency of marital conflict has been shown to affect children’s short-term coping skills as well as long-term adjustment (Cummings & Davies, 2002; Parke & Buriel, 2006). More specifically, high levels of marital conflict have been found to predict both internalising and externalising problems for girls, and externalising problems for boys (El-Sheikh & Whitson 2006).

An early study of donor insemination families conducted in the United States found the rate of parental separation to be low compared to population norms (Amuzu et al., 1990). In a similar vein, early studies found the marriages of parents in donor insemination families to be stable and to be functioning within the normal range (Klock & Maier 1991; Klock et al. 1994). In studies of both donor insemination and egg donation families conducted in the 1980s and 1990s, couples reported that the experience of infertility and undergoing fertility treatment had bought them closer together and had improved the quality of their relationships (Applegarth et al. 1995; Leeton & Backwell 1982). The finding that fertility treatment results in an improvement in marital quality has also emerged in studies of couples who have undergone successful fertility treatment using their own gametes (Schmidt et al. 2005; Repokari et al. 2007). Cross-sectional studies can only reveal a snapshot of family functioning at a given time-point (often when the long-awaited child has arrived). In order to examine marital
stability over time, follow-up studies are required. In the European Study of Assisted Reproduction families, donor insemination, IVF, adoptive and natural conception families were recruited in the United Kingdom, the Netherlands, Italy and Spain. Family functioning was assessed when the children were aged between 4 and 8 years (Golombok et al. 1996), 12 years (Golombok et al. 2002) and 18 years (Owen & Golombok 2009). By the time the offspring were 18 years old, 12% of couples had separated or divorced, with similar proportions of parents having separated or divorced in the different family types. In terms of the quality of the parents’ relationship, few differences were identified for mothers or fathers according to family type throughout the course of the study.

In contrast, evidence of instability was found in a follow-up study of donor insemination families in New Zealand: of a sample of 44 families who were revisited 14 years after undergoing fertility treatment with donor sperm, 46% of couples had either divorced or separated (Daniels et al., 2009). Although the rate of separation was not compared to population norms in New Zealand, the authors suggested that this high rate of separation may be related to the degree to which participants had been prepared for their donor insemination treatment.

The present study explored marital stability, state and quality in a UK sample of families created through third-party donation (donor insemination, egg donation and surrogacy) and families in which parents conceived naturally over five time-points, when the children in the families were aged 1, 2, 3, 7 and 10.

Materials and Methods

Participants
In the first phase of the study, 50 donor insemination families, 51 egg donation families, 42 surrogacy families and a comparison group of 80 natural conception families with a 1-year-old child participated. The egg donation and donor insemination families were recruited through 9 fertility clinics in the United Kingdom. All two-parent heterosexual families with a child aged between 9 months and 1 year old were asked to take part in the research. The exclusion criteria were severe congenital abnormalities and multiple births. The natural conception families were selected through maternity ward records on the basis of stratification to maximise comparability with the assisted reproduction samples. The selection criteria were that the child resulted from a singleton birth with a minimum of 30 weeks gestation, the child had no congenital abnormalities, the mother was at least 30 years of age, the child was the mother’s first or second child, the mother was married to, or cohabiting with, the child’s father, and the pregnancy had been planned (Golombok et al., 2004a). A representative sample of surrogacy families was recruited through the UK Office of National Statistics and the surrogacy agency COTS (Golombok et al., 2004b).

These families were assessed when the children were aged 1, 2, 3, 7 and 10 years old (response rates for each phase of the study are presented in Table 1). By age 10, the study included 34 families with a child conceived by donor insemination, 30 families with a child conceived by egg donation, 33 families with a child born through surrogacy, and 55 families with a naturally conceived child, representing 68% of the original sample, with no significant difference in retention rates between family types. Rather than actively withdrawing, the majority of those families lost to follow-up had moved home and could not be traced.

The demographic variables of those families who participated when the children were aged 10 (responders) were compared with those who did not participate at this phase of the study (non-responders). There was no association between whether families participated at age 10 and the following variables: method of conception (assisted
reproduction vs. non-assisted reproduction), mothers’ intention regarding whether to
tell their child about the nature of their conception reported at age 1 (plan to disclose,
uncertain, plan not to disclose), mothers’ age, and whether the couple had male or
female infertility. However, there was a significant association between socioeconomic
status measured at age 1 and whether or not families took part at age 10: $\chi^2 (2) = 6.76, p < .05$. Families were categorised as: 1) professional/managerial; 2) skilled non-manual;
or 3) skilled manual. Those families classified as professional/managerial were more
likely to take part at age 10 (73%), and the families least likely to take part at age 10
were those classified as skilled non-manual (56%) and skilled manual (53%).

Demographic variables were compared between the different family types at each
phase of the study. Mothers’ age differed between groups, with Helmert contrasts
revealing mothers in assisted reproduction families as being significantly older than
mothers in natural conception families. Helmert contrasts also revealed that mothers in
egg donation families were significantly older than mothers in donor insemination
families. In addition, there was a significant difference in family size, with a greater
number of siblings in natural conception families as compared to assisted reproduction
families. Socioeconomic status was also found to differ between family types. The
majority of parents in natural conception families were categorised as
professional/managerial, whereas socioeconomic status was more evenly spread in the
donor insemination families.

**Procedure**

Ethical approval for the earlier phases of the study (when children were aged 1, 2 and 3)
was obtained from the City University Ethics Committee, and ethical approval for the
latter phases (when children were aged 7 and 10) was gained from the Cambridge
Psychology Research Ethics Committee. When children were aged 1, 2, 3, 7 and 10, a
research psychologist trained in the study techniques visited the families at home. A
standardised interview and questionnaire relating to the quality of the marital
relationship were administered to mothers and fathers individually.

Measures

Mothers and fathers were administered both interview and questionnaire measures to
assess marital quality. Questionnaires were administered to mothers and fathers at
each phase of the study, whereas interview ratings of mothers’ and fathers’ marital
quality were only collected when children were aged 1, 7 and 10. Interview ratings of
marital quality were not obtained when children were aged 2 because a more concise
interview schedule was administered to parents that excluded some questions related
to marital quality, and when children were aged 3, interviews were only conducted with
mothers.

*Questionnaire measure of marital quality*: Mothers and fathers completed the
Golombok-Rust Inventory of Marital State (Rust et al. 1990), a 36-item questionnaire
assessment of the overall quality of the relationship between couples who are either
married or cohabiting. Scores range from 0 to 84, with higher scores indicating poorer
marital quality. A score of 34 or more indicates marital dissatisfaction. Split-half
reliability for this measure is 0.91 for men and 0.87 for women, and the questionnaire
has been shown to discriminate between couples who are about to separate and those
who are not.

*Interview measures of marital stability and quality*: As part of a more general
assessment of family functioning, a standardised interview designed to measure the
quality of the marital relationship was administered to mothers and fathers separately.
Information obtained during the interview was rated according to a standardised coding
scheme (Quinton & Rutter, 1988). The following ratings were made:
Marital stability: A rating was made of the family structure (married/cohabiting, divorced/separated).

Marital quality: *Enjoyment of shared activities* ranged from: 1 (a great deal), 2 (quite a lot), to 3 (some). *Confiding* ranged from: 1 (all important matters discussed adequately), 2 (the majority of important matters discussed adequately), to 3 (some/ a minority of important matters adequately discussed). *Quality of marriage* was rated on a 3-point scale, ranging from: 1 (marriage/cohabitation positive source of support and enjoyment), 2 (good marital/cohabitation history), to 3 (overall satisfactory history but some problems, or worse). At each time-point, these three variables yielded a single factor and all factor loadings were moderate to substantial (ranging from .68 to .91). The scores from these three variables were combined to create an index of marital quality.

**Results**

**Marital stability**

At phase 1 of the study all couples were married/cohabiting. Of those couples who were still participating in the study when the children were 10 years old, 19 (15%) couples had divorced/separated (15% DI, 13% ED, 15% SU, 9% NC). At age 10, there was no difference in marital stability between family types (donor insemination vs. egg donation vs. surrogacy vs. natural conception): $\chi^2 (3) = 1.37$, *ns*. Those parents who conceived a child using donated sperm, donor eggs or a surrogate were just as likely to remain married/cohabiting after 10 years as those couples who conceived naturally. Likewise, marital status was not associated with the couples’ method of conception (ART vs. natural conception): Fisher’s Exact test = *ns*. Parents who conceived using ARTs were just as likely to be married after 10 years as those couples who conceived naturally.
Marital quality

Questionnaire measure

Mothers’ and fathers’ marital quality was compared between the different family types at each time-point (see Table 2). In terms of mothers’ marital quality, the only difference to emerge was when the children in the families were 2 years old ($F(3) = 2.67, p < .05$). Helmert contrasts revealed that mothers in natural conception families had higher levels of marital satisfaction (indicated by a lower mean score on the GRIMS) than mothers in ART families.

Fathers’ marital satisfaction was compared between the different family types at each time-point. No differences were found.

Interview measure

Mothers’ marital quality was compared between the different family types at the time-points, when children were aged 1, 7 and 10 (see Table 3). A significant difference between groups was found for mothers when the children were aged 7 years old: $F(3) = 2.62, p = .05$. Helmert contrasts were not statistically significant. Mothers in the surrogacy families had the lowest levels of marital quality, and those in egg donation families had the highest levels.

Fathers’ marital quality was compared between family types at each phase of the study. Once again, no differences were found between the different family types.

The relationship between the demographic variables that differed between groups (mothers’ age, family size and socioeconomic status) and the outcome variables that
differed significantly different between groups were examined. No significant relationships were found.

**Discussion**

Marital stability and marital quality was examined in a longitudinal study of families created by donor insemination, egg donation, surrogacy and families in which parents conceived naturally. Comparisons were conducted at five time-points, when the children in the families were aged 1, 2, 3, 7 and 10. Few differences emerged between the different family types in terms of mothers’ or fathers’ marital quality as assessed by self-report questionnaire and investigator-based interviews. The couples in all of the different family types appeared to be functioning well.

Of the families who were participating when children were 10 years old, a minority of couples in each family type had divorced/separated. This appears to be marginally lower than the average rate of divorce in the UK: statistics from 2005 indicate that approximately 45 per cent of marriages will end in divorce and that almost half these divorces will occur before couples reach their tenth anniversary (Wilson & Smallwood 2008). The findings in this study are contrary to the findings of Daniels et al (2009), in which approximately 45% of donor insemination couples had separated when assessed 14 years after their original assessment. This disparity could be explained by the differences in sampling techniques, the time that had lapsed between follow-up studies (10 years in the present compared to 14 years in the New Zealand study), or the cultural and social contexts in which the studies were conducted. In addition to the relatively low rate of separation/divorce, mothers’ and fathers’ scores on the standardised questionnaire of marital state indicated that their levels of marital satisfaction were typically above average.
Of interest to future researchers in this field will be the relationship between marital quality and parents' decision to whether to tell the child about their donor conception. In adoption research, fathers who are committed to maintaining a good relationship with their partner have been found to be more likely to be involved in communication about the adoption (Freeark et al, 2008). Mothers' and fathers' level of involvement in adoption communication were also found to be significantly correlated: couples either engaged collaboratively in communication about adoption with their children, or both parents avoided the topic.

The findings presented in this paper have a number of limitations. Firstly, those families in which couples were experiencing many difficulties may have been the most likely to have dropped out over the ten year span of the study. It is likely that a selection effect has been in play from the time couples started their fertility treatment, as those couples who did not have a strong relationship may have been the least likely to last the course of fertility treatment and go on to have a child. However, it should be noted that in the present study, mothers and fathers' marital quality at age 1 was found to be unrelated to whether or not families participated at age 10. Secondly, this study under-represents families of a lower economic status, as these families were the most likely to drop-out over time. Thirdly, in order to examine marital stability and quality over time and make comparisons between the different family types, a longitudinal statistical approach is desirable. Due to small and diminishing sample sizes, this was not considered to be an appropriate statistical approach in the present study. Although the difficulties of recruiting a sample of this nature cannot be underestimated, future studies would benefit from larger sample sizes. The two differences that did emerge in the analysis (in mothers' marital quality at age 2 as assessed by questionnaire, and age 7 as assessed by interview), may be chance effects resulting from multiple comparisons being conducted. Larger samples would allow for more stringent statistical comparisons to be conducted, and for small differences between groups to be detected over time, were they to exist.
Despite its limitations, this study is unique in presenting data from donor insemination, egg donation and surrogacy families over five time-points. That few differences emerged between groups contributes to the growing body of research in this field which demonstrates that families created by donor insemination, egg donation and surrogacy are functioning well.

References


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Golombok, S., Brewaeys, A., Cook, R., Giavazzi, M.T., Guerra, D., Mantovani, A., Hall, E.,
Crosignani, P.G., Dexeus, S. 1996. The European study of assisted reproduction
families: Family functioning and child development. HUM REP, 11(10), p.2324-
2331.

Golombok, S., Giavazzi, M.T., Guerra, D., MacCallum, F., Rust, J. 2002. The European
study of assisted reproduction families: the transition to adolescence. HUM REP,

Clinicians. New York: Cambridge University press.


STERIL, 56(3), p.489 - 495.

children conceived by artificial insemination by donor (AID). Clinical Reproduction

Owen, L. & Golombok, S., 2009. Families created by assisted reproduction: Parent child

Parke, R.D. & Buriel, R., 2006. Socialization in the family: ethnic and ecological

Repokari, L., Repokari, L., Punamäki, R.L., Unkila-Kallio, L., Vilska, S., Poikkeus, P.,
Sinkkonen, J., Almqvist, F., Tiitinen, A., Tulppala, M., 2007. Infertility treatment and
marital relationships: a 1-year prospective study among successfully treated ART

Rust, J., Bennum, I., Crowe, M., Golombok, S. 1990. The GRIMS. A psychometric
instrument for the assessment of marital discord. J FAM THER, 12, p.45-57.

PATIENT EDUC COUNS, 59(3), p.244-251.

Wilson, B. & Smallwood, S., 2008. The proportion of marriages ending in divorce.
Table 1: Response Rates for all Family Types at each Phase of the Study

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<th>ED</th>
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<tr>
<td>Phase 1</td>
<td>50</td>
<td>51</td>
<td>42</td>
<td>80</td>
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<td>Phase 2</td>
<td>46</td>
<td>48</td>
<td>37</td>
<td>68</td>
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<tr>
<td>% original sample</td>
<td>92%</td>
<td>94%</td>
<td>88%</td>
<td>85%</td>
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<td>Phase 3</td>
<td>41</td>
<td>41</td>
<td>34</td>
<td>67</td>
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<td>% original sample</td>
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<td>80%</td>
<td>81%</td>
<td>84%</td>
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<td>Phase 4</td>
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<td>32</td>
<td>32</td>
<td>54</td>
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<tr>
<td>% original sample</td>
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<td>67%</td>
<td>76%</td>
<td>68%</td>
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<tr>
<td>Phase 5</td>
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<td>55</td>
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<tr>
<td>% original sample</td>
<td>68%</td>
<td>59%</td>
<td>79%</td>
<td>69%</td>
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N.B. Sample sizes do not always decrease over time, as in some cases families were unable to participate during one phase of the study (e.g. a family event, moving house) but were then able to participate at a later phase.
Table 2: CROSS-SECTIONAL ANALYSIS: Mothers’ and Fathers’ Questionnaire Ratings of Marital Quality

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<tr>
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<th>Mothers’ Marital Quality</th>
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### Table 3: CROSS-SECTIONAL ANALYSIS: Mothers’ and Fathers’ Interview Ratings of Marital Quality

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<td>Age 10</td>
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<td>5.69</td>
<td>1.72</td>
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