



Contents lists available at ScienceDirect

European Journal of Obstetrics & Gynecology and Reproductive Biology

journal homepage: www.elsevier.com/locate/ejogrb

Full length article

Investigating knowledge and perceptions of egg sharing among healthcare professionals in the United Kingdom

Timothy Bracewell-Milnes^{a,*}, Sara Rajendran^b, Srdjan Saso^b, Benjamin Jones^b, Sophie Platts^b, Sarah Cato^c, Meen-Yau Thum^d

^a Division of Surgery and Cancer, Institute of Developmental Reproductive & Developmental Biology, Imperial College London, Chelsea and Westminster Hospital Campus, 369 Fulham Rd, London, UK

^b Division of Surgery and Cancer, Institute of Reproductive & Developmental Biology, Imperial College London, Hammersmith Hospital Campus, Du Cane Road, London, UK

^c The Surgery, 20 Lee Road, Blackheath, London, SE3 9RT, UK

^d The Lister Hospital, Chelsea, London, UK



ARTICLE INFO

Article history:

Received 5 December 2018

Received in revised form 1 March 2019

Accepted 3 March 2019

Keywords:

Infertility
Egg donation
Egg sharing
Egg recipient
Psychology
Healthcare professionals
Attitudes
Knowledge

ABSTRACT

Objective: This study aims to determine the healthcare professionals knowledge and opinions of egg sharing and does this potentially effect egg sharing numbers in the UK?

Study design: 304 healthcare professionals undertook a large, in-depth survey about various topics related to egg sharing. This included ranking key benefits and issues related to egg sharing. Statistical analysis was performed using SPSS.

Results: 63.1% of respondents had little or no knowledge of egg sharing, although the majority supported the scheme once a short description was provided. Although attitudes towards egg sharing were positive, there was more support for voluntary donation. The issues surrounding egg sharing of most concern were the psychological well-being of the egg sharer if her own treatment is unsuccessful and the concern that giving away half her eggs reduces IVF success rates. Only 16.5% of respondents had previously referred a patient for egg sharing, with the majority citing lack of knowledge for the reason they hadn't referred.

Conclusions: Egg sharing allows women to receive free or subsidised IVF in exchange for donating half their oocytes collected to a recipient. Although egg sharing was intended to solve the current donor oocyte shortage, egg sharing numbers have fallen over recent years. Education of healthcare professionals about the egg sharing programme and the research that supports it could improve their perceptions of egg sharing, increasing referral rates and egg sharing numbers.

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Introduction

The technique of oocyte donation was developed in the early 1980s and their use is now mainstream [1]. Certain patients undergoing IVF have very poor success rates with their own oocytes, meaning egg donation is the only realistic option for them achieving a pregnancy [2,3]. Demand for egg donors has been steadily on the rise globally, with couples increasingly using it to overcome their infertility [4].

Oocyte donors can be either 'known' (to the recipient) or 'anonymous'. A known donor is sourced by the recipient themselves, usually a close friend or relative. Anonymous donors can be further classified into 'voluntary' (donating for altruistic

reasons); 'commercial' (donating for monetary payment); or 'egg sharers' (a patient donor who donates a proportion of their oocytes to an anonymous recipient for free or subsidized fertility treatment). In the UK the Human Fertilisation and Embryology Authority (HFEA) caps payments to oocyte donors at £750, meaning commercial donation is not possible [5]. Unlike with donor sperm, the process of egg donation involves multiple appointments and medically invasive treatments for the donor, such as ovarian stimulation and transvaginal egg collection. Unsurprisingly, very few women are willing to donate as volunteers and the supply of donor eggs in the UK falls short of demand [2]. Egg sharing is a potential solution to this problem, but nevertheless this type of donation has been at the centre of much ethical and political debate since its introduction [6–8]. Beyond providing another source of donor oocytes, egg sharing has other advantages. First, no third party needs to undergo ovarian stimulation and invasive trans-vaginal oocyte collection to benefit

* Corresponding author.

E-mail address: timothy.bracewell@imperial.ac.uk (T. Bracewell-Milnes).

the recipient, since the donor needs to undergo this treatment for her own needs. Second, those who do not qualify for government funded IVF and cannot afford to self-fund gain welcome access to fertility treatment. Third, it provides an opportunity to help an anonymously matched recipient in a practical way. However, some potential concerns surrounding egg sharing have been debated over the years. First, regarding the quality of consent of the donor, with her only agreeing to donate to gain access to much desired treatment [9]. Second, the psychological well-being of the egg share donor, especially if she fails to achieve a pregnancy while her recipient's treatment is successful [10]. Third, the potential impact on the child if they were to find out their parents indirectly paid a donor to contribute.

Despite an acute shortage of oocyte donors and its benefits, egg sharing numbers have been on the decline in the United Kingdom over recent years. In 2016, although 3924 IVF cycles used donor oocytes, there were only 577 cycles using egg sharing, which is a 7% decrease from 2015. It has been suggested that this downward trend is a consequence of UK legislative changes in 2005, which mean that any gamete donor consents to their identity being released to any resulting offspring requesting it upon turning 18. The passing of this controversial legislation was anticipated to effectively end gamete donation in the UK [11,12]. Indeed initially there was a decline in both newly registered known, volunteer and egg share donors [5]. Since 2007, numbers of newly registered non-patient oocyte donors have increased every year, however this is not the case with egg sharers. This drop is concerning in a group that used to constitute the majority of egg donors in the UK.

The impact of this is long waiting lists and limited choice of oocyte donors in the UK, especially among ethnic minorities [13,14]. This has caused some patients to seek treatment abroad, where oocytes are more readily available, but where regulations are less strict [15], a process known as cross-border reproductive care (CBRC). Identifying this, the HFEA implemented changes aimed at improving recruitment of oocyte donors registering, the most significant of which was providing egg donors up to £750 compensation per cycle, replacing the previous limit of £250 [16]. This policy change is not targeting egg share donors and the HFEA have not discussed how recruitment of egg share donors could be optimized, which could be explained by the contentious history of egg sharing.

A possibility for the decreasing popularity of egg sharing is that healthcare professionals are not informing fertility patients of their options. One study into the attitudes and experience of egg sharers found that only 4.3% of them were first informed of egg sharing by their general practitioner (GP), and they reported this to be a significant source of frustration [17]. This could be for a variety of reasons, including lack of knowledge of egg sharing or not agreeing with its practice. It is particularly important to establish the reasons behind the failure of healthcare professionals to suggest egg sharing, but despite this no study has investigated this issue.

Aims

Egg sharing is unquestionably an interesting ethical area of reproductive medicine. Despite being in widespread clinical practice globally, the views of healthcare professionals towards egg sharing has not been studied. This study aims to fill in this gap in our knowledge by formally investigating the views that healthcare professionals in the UK have of egg sharing, and to determine their knowledge of egg sharing, and the proportion of them that have referred a woman for egg sharing.

Materials and methods

An in-depth survey investigating healthcare professionals' opinion of egg sharing was designed. The survey consists of a simple

questionnaire that takes 15 minutes to complete. The questionnaire format was based on the previously validated studies investigating the attitudes towards face and uterine transplantation [18,19]. The benefits and issues of egg sharing that participants were asked to consider were selected based on their identification in previous literature reviews [20–22]. Feedback was obtained on the questionnaire by the uterine transplant team who previously published a similar survey [18], and content validation on the questionnaire was performed by the egg donation team at The Lister fertility clinic, London, who determined the questionnaire addressed the topic overall. The questionnaire was piloted on 20 healthcare professionals, who assessed whether the questionnaire asked what it should about egg sharing.

The three target populations were general practitioners, obstetricians and gynaecologists and fertility specialists, although healthcare professionals from a variety of other fields were also recruited. The recruitment process was by convenience and chain sampling. The questionnaires were designed using mainly closed-ended questions, but open-ended comment fields were also used, facilitating both quantitative and qualitative data analysis. The questionnaire was available in both paper format and online, using the Qualtrics survey tool. Paper questionnaires were then manually entered onto the Qualtrics platform. The questionnaire contained four main sections: (i) healthcare professional characteristics; (ii) views on oocyte donation in general; (iii) knowledge and views on egg sharing; (iv) ranking various benefits and issues surrounding egg sharing.

Statistical analysis of the quantitative data was performed using the Qualtrics survey tool and SPSS. Comparison of views between different medical fields was done with Fisher's Exact Test. Distribution of mean grades from the ranking of the benefits and issues of egg sharing were checked with the Shapiro-Wilk test of normality, and then compared across medical fields using the Mann-Whitney *U* test.

Results

Population characteristics are shown in Table 1. A total of 324 participants took part in the study. Of these, 20 were excluded as only the first section had been completed. In a further 48 responses, one or more questions were left unanswered, but these responses were not excluded from analysis. The majority of participants were aged 25–34 years (43.6%) and female (73.3%).

Table 2 summarises the cohort's responses on various aspects of oocyte donation and egg sharing. There was strong support for oocyte donation in general, with 89.8% of healthcare professionals agreeing or strongly agreeing that it is a useful and welcome addition to fertility treatment, with only 2.3% of participants disagreeing with the use of oocyte donation.

Healthcare professionals report a lack of knowledge surrounding egg sharing, with 63.1% of respondents knowing nothing or very little about it. 21.5% knew 'a fair amount', with only 15.4% stating they have extensive knowledge about egg sharing. Following a brief statement explaining the concept of egg sharing, respondents were asked whether they felt egg sharing could present a viable solution to the donor oocyte shortage. 67.1% felt it could provide a solution, with 10.7% stating they felt it did not, and 22.2% undecided. The majority (63.4%) also felt egg sharing was ethically different to commercial oocyte donation. A significant majority (78.2%) of healthcare professionals felt that egg sharing should take place. Although this is a significant majority, the cohort was less positive about egg sharing than oocyte donation in general.

Knowledge of egg sharing and referral rates

To explore how respondents' knowledge and perceptions differ among different specialties, the analysis was split into participants

Table 1
Population characteristics.

Characteristic (total no. of respondents)	% of respondents	
Age, y (n = 303)		
18–24	18.5	(n = 56)
25–34	43.6	(n = 132)
35–44	16.2	(n = 49)
45–54	13.2	(n = 40)
55–64	7.9	(n = 24)
>65	0.7	(n = 2)
Sex (n = 304)		
Male	26.3	(n = 80)
Female	73.7	(n = 224)
Profession (n = 303)		
Midwife	20.5	(n = 62)
Obstetrician and gynaecologist	19.5	(n = 59)
Medical student	12.2	(n = 37)
General practitioner	9.9	(n = 30)
Hospital doctor	9.6	(n = 29)
Counsellor	6.3	(n = 19)
Staff nurse	5.0	(n = 15)
Fertility nurse	3.3	(n = 10)
Fertility specialist	2.6	(n = 8)
Embryologist	2.6	(n = 8)
Other	8.6	(n = 26)
Experience in the medical field, years (n = 304)		
<1	3.6	(n = 11)
1–5	37.5	(n = 114)
5–10	26.0	(n = 79)
>10	32.9	(n = 100)
Personal experience of infertility (n = 301)		
Yes	14.6	(n = 44)
No	85.4	(n = 257)

from the fertility field (fertility specialists, fertility nurses, embryologists) and respondents from all other medical fields. Comparison of opinions and knowledge of egg sharing is shown in Table 3. Unsurprisingly, there was significant difference in the extent of knowledge of egg sharing ($p < 0.05$, Fisher's exact test), with 100% of participants from the fertility field having at least a 'fair amount' of knowledge, compared to 30.9% of respondents from other medical fields. Although positivity towards oocyte donation in general did not statistically significantly differ between the two groups, acceptance of egg sharing taking place was higher amongst those from the fertility field (96.2%), which was significantly more than the 76.5% of other medical professionals ($p < 0.05$, Fisher's exact test).

Healthcare professionals who are able to refer patients to an egg sharing programme (GPs, obstetricians and gynaecologists and fertility specialists) were asked whether they had done so, and if not, their reasons why. In total, only 16.5% of participants had referred a patient for egg sharing. The vast majority cited lack of knowledge as the reason for this. 76.6% of GPs were either unaware of egg sharing or felt they did not know enough about it to refer a patient. In contrast, 75% of fertility specialists had previously made an egg sharing referral, and none of the fertility specialists lacked knowledge of the programme.

Ranking benefits and issues of egg sharing

Respondents were asked to grade the importance of eight issues commonly directed at egg sharing. Each issue was given a grade between 1 (least significant) and 5 (most significant), and the results are summarised in Table 4. The highest scoring issue was the concern for the psychological well-being of a donor whose own IVF fails, as she is able to find out if the recipient's treatment was

Table 2
Summary of respondents' responses regarding oocyte donation and egg sharing.

Opinion (total no. of respondents) ^a	% of respondents	
'Oocyte donation is a useful addition to the field of fertility' (n = 304)		
Agree	89.8	(n = 273)
Disagree	2.3	(n = 7)
Undecided	7.9	(n = 24)
In agreement with the 'Disclosure of Donor Information' legislative change (n = 224) ^b		
Yes	60.7	(n = 136)
No	13.8	(n = 31)
Undecided	25.5	(n = 57)
Would be dissuaded from donating oocytes by the "Disclosure of Donor Information" legislation (n = 215) ^{b,c}		
Yes	16.3	(n = 35)
No	62.8	(n = 135)
Undecided	20.9	(n = 45)
In agreement with £750 cap on compensation for oocyte donors in the UK (n = 303)		
Yes	45.2	(n = 137)
No	26.4	(n = 80)
Undecided	28.4	(n = 86)
Extent of knowledge regarding the UK egg sharing programme (n = 298)		
A lot	15.4	(n = 46)
A fair amount	21.5	(n = 64)
Little to none	63.1	(n = 188)
'Egg sharing presents a viable solution to the donor oocyte shortage' (n = 298)		
Yes	67.1	(n = 200)
No	10.7	(n = 32)
Undecided	22.2	(n = 66)
'There is an ethical difference between egg sharing and commercial oocyte donation' (n = 295)		
Yes	63.4	(n = 187)
No	28.8	(n = 85)
Undecided	7.8	(n = 23)
'Egg sharing should take place' (n = 298)		
Yes	78.2	(n = 233)
No	7.7	(n = 23)
Undecided	14.1	(n = 42)

^a n numbers vary due to incomplete questionnaires.

^b Questions regarding the 'Disclosure of Donor Information' legislation were answered by female respondents only.

^c This question was not applicable to 8 respondents, due to their advanced age.

successful. The second highest mean score (3.78) was that a second stimulation cycle may be required to obtain enough oocytes for the egg sharer and her recipient. The third highest mean score (3.66) was that the outcome of the egg sharer's IVF is adversely affected by giving up half of the collected oocytes.

Healthcare professionals were also asked to grade the importance of five potential benefits of egg sharing. Each benefit was a given a grade between 1 (least significant) and 5 (most significant), and the results are summarised in Table 5. All of the benefits were given a mean score of more than 4, compared to the issues, whereas only the top ranked issue had a mean score of greater than 4. Access to IVF for women who do not qualify for NHS funding and cannot self-fund was considered the most important advantage (4.22), with the lack of third party involvement in the ovarian stimulation and oocyte collection procedures found to be nearly as significant (4.21).

Fertility specialists and respondents from all other medical fields also differed in their assessments of the benefits and issues surrounding egg sharing (Fig. 1). Respondents from the fertility field gave a significantly higher grade to the overall benefit of egg sharing than non-fertility field respondents ($p < 0.05$, Mann-

Table 3

Comparison of respondents' opinions of oocyte donation and egg sharing according to their field of practice.

Opinion	% of respondents from fertility field ^a n = 26		% of respondents from other fields n = 278 ^b		Fisher's exact p
'Oocyte donation is a useful addition to the field of fertility'					NS
Agree	100.0	(n = 26)	88.9	(n = 247)	
Disagree	0.0	(n = 0)	2.5	(n = 7)	
Undecided	0.0	(n = 0)	8.6	(n = 24)	
Extent of knowledge regarding the UK egg sharing programme					<0.001
A lot	73.1	(n = 19)	9.9	(n = 27)	
A fair amount	26.9	(n = 7)	21.0	(n = 57)	
Little to none	0.0	(n = 0)	69.1	(n = 188)	
'Egg sharing should take place'					0.034
Yes	96.2	(n = 25)	76.5	(n = 208)	
No	3.9	(n = 1)	8.1	(n = 22)	
Undecided	0.0	(n = 0)	15.4	(n = 42)	

NS = non-significant.

^a Professions classed as part of the fertility field include fertility specialists, fertility nurses, and embryologists.^b n numbers may not total 278 due to incomplete responses.**Table 4**

Average score given to potential issues surrounding egg sharing according to their significance. 1 = least significant, 5 = most significant. Mean calculated using only responses where all 8 issues were scored (n = 261).

Issues	Mean score
Potential adverse effect on the psychological well-being of the donor if her own treatment fails	4.19
The donor may require a repeat stimulation cycle and egg collection in order to obtain enough eggs for both herself and the recipient	3.78
The chances of the donor conceiving as a result of her fertility treatment could be reduced by the donation of half of her eggs	3.66
The donor may only have agreed to share her eggs in order to gain access to fertility treatment	3.60
Potential adverse effect on the psychological well-being of the donor as the recipient is conceiving her genetic offspring	3.59
The consent of the egg donor is questionable due to her desperation to conceive	3.57
The act of donating eggs in exchange for subsidised fertility treatment is contrary to a cultural preference for voluntary donation	2.90
The recipient must pay for fertility treatment while the donor receives it for free	2.82

Table 5

Mean grade given to 5 benefits of egg sharing according to their significance. 1 = least significant, 5 = most significant. Mean calculated using only responses where all 8 issues were scored (n = 261).

Issues	Mean score
Provides access to IVF for women who are not eligible for NHS-funded treatment and cannot afford to pay for IVF themselves	4.22
Eliminates the need for a third party to undergo an invasive oocyte collection procedure	4.21
Gives a woman suffering from infertility the opportunity to help someone in a similar situation	4.11
Has the potential to reduce the waiting list for donor oocytes, and therefore the number of women going abroad to seek fertility treatment	4.11
Provides a viable solution to the acute shortage of oocyte donors	4.04

Whitney U test), while giving a lower significance to the issues ($p < 0.05$, Mann-Whitney U test).

Discussion

Overall, the participants appear to strongly support oocyte donation in general, as well as egg sharing, with 89.8% of healthcare professionals supporting oocyte donation, and 78.2% of respondents believing egg sharing should take place. Therefore, although both are held in a positive light, it appears the acceptance amongst the medical community of egg donation in general is more widespread than egg sharing. Considering its controversy however, the fact that almost 4 out of 5 healthcare professionals felt positively about the egg sharing scheme is reassuring.

The issue that medical professionals rated as the most concerning is the potential adverse effect on the psychological well-being of the egg sharer if her own treatment is unsuccessful. Three systematic reviews have reported on studies investigating the psychological well-being of egg sharers [21–23], and concluded that the data is overwhelmingly reassuring for the psychological well-being of both egg share donors and their recipients. They did not feel the egg sharing scheme exploited them, but instead supported the view that egg sharing represents a 'win-win' for

both parties. Importantly, one study reported that 89% of egg share donors whose fertility treatment had been successful found the donation experience positive, and when their treatment had been unsuccessful 90% of egg share donors still felt positively of their experience [24]. Another study surveyed egg sharers between 3 and 5 years after their treatment and concluded that the outcome of the egg sharer's treatment had no effect on how frequently they thought about any children the recipient could have [17]. The same study also found that in most cases where the donor's treatment was unsuccessful and the recipient's successful, the egg sharer felt positively about the recipient's pregnancy [17].

The second highest scoring issue the medical professionals reported was the concern that egg sharing could adversely effect the outcome of the egg share donor's fertility treatment. The largest study investigating this included 192 egg sharers, 274 recipients and 1098 standard IVF patients and found no significant difference in pregnancy and live birth rates between all three groups [25]. This is very reassuring data for egg share donors, who can be counselled that participating in the scheme does not effect their chances of conceiving.

A commonly raised ethical concern regarding egg sharing was that it exploits desperate women who cannot self-fund their IVF [8,11]. Respondents in this survey raised concerns regarding the

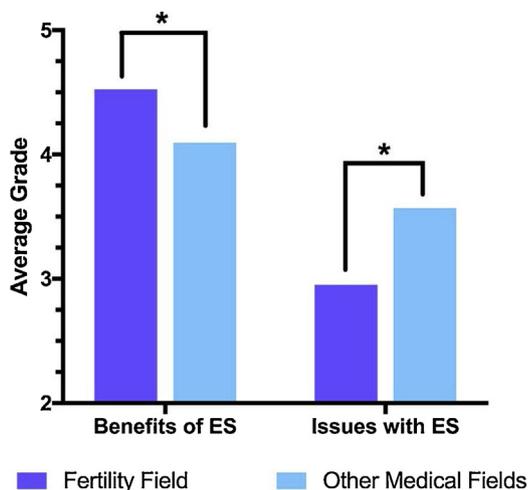


Fig. 1. Comparison of mean score given for benefits and issues with egg sharing by respondents from the fertility field and respondents from other medical fields. Average score calculated from individual scores given to 5 potential benefits and 8 potential issues by respondents from each group. Only responses where all benefits or all issues were scored were included in the calculation. Benefits: n=26 for fertility field, n=274 for other fields. Issues: n=23 for fertility field, n=261 for other fields. 1 = least significant, 5 = most significant. * p=0.001, calculated with Mann-Whitney U test.

donor only agreeing to share her oocytes in order to gain access to fertility treatment, and the consent of the donor being questionable due to her desperation to conceive. Interestingly, although concerns were raised, healthcare professionals felt the most significant benefit of egg sharing is that it gives those same women the chance to have fertility treatment and that it eliminates the need for a third party to undergo invasive ovarian stimulation and vaginal egg collection. Data addressing these issues in studies are reassuring. One study reported that over 80% of egg sharers surveyed disagreed that egg sharing was exploitative [26]. In the same cohort, 91.7% of donors were glad to have participated in egg sharing, and 83.3% would make the decision to donate again with the benefit of hindsight [26]. Even when their own treatment was unsuccessful, the significant majority of egg share donors expressed no regret at having participated in the scheme [24,26]. Although most egg sharers were motivated to join the scheme by the promise of discounted treatment, the majority would have at least considered participating even if they could afford their own IVF, and a significant minority would have considered donating oocytes without any financial incentive [17,20]. Although these concerns are logical, it seems unlikely that these donors would express such positivity towards their egg sharing experience if they felt they were pressured into taking part. Indeed, the Sperm, Egg and Embryo Donation (SEED) report (2005) states “if an egg provider’s judgement were really obscured by the promise of free treatment, one might expect to find evidence of people complaining about this afterwards, or at least some egg providers later regret giving up their eggs” [21].

The incentivisation of gamete donation is a much debated and controversial area, with different countries having differing legislation. The HFEA states that financially rewarding donation would ‘contravene the principles of altruism and free choice’, and therefore commercial oocyte donation is illegal in the UK, with any remuneration compensatory only, capped at £750 [27]. In contrast, commercial egg donation is integrated into the USA healthcare system, and the American Society for Reproductive Medicine have previously recommended \$5000–\$10,000 as an appropriate reward for the ‘time, inconvenience, risks, and physical and emotional demands’ involved in oocyte donation [28]. It should be

noted this guideline has been revoked following accusations of price fixing [28]. It was interesting that in the medical community surveyed in this study, concerns regarding incentivisation appeared to be relatively minor. Over half the respondents did not agree with the HFEA limit on compensatory payments, with many believing the £750 compensatory cap was insufficient recompense for the time and inconvenience associated with egg donation. The cohort also attached little significance to the cultural preference for voluntary donation, ranking it as seventh most important of the eight concerns. Some respondents expressed favourable attitudes towards genuine commercial oocyte donation, suggesting that increasing the £750 limit would attract more donors and decrease the donor oocyte shortage. This positivity towards increasing financial compensation suggests that concerns about incentivisation are not a significant obstacle to accepting egg sharing. Putting aside the controversy of commercial egg donation, 63.4% of respondents do not see egg sharing as ethically equivalent to commercial donation, so negative attitudes towards the concept of financial incentivisation appear to not apply.

It is of significance that although attitudes amongst the medical community towards egg sharing were slightly less favourable than for voluntary or known donation, 78.2% of healthcare professionals felt that egg sharing should take place, with 67.1% feeling it provided a potentially viable solution to the donor oocyte shortage. Support for programme amongst the respondents is further evidenced by the fact that they ranked all of the five potential benefits of egg they were surveyed on a mean score greater than four (maximum score five), whilst they only ranked one of the eight issues they were questioned on a mean score greater than four.

Although the majority of the concerns raised by the respondents about egg sharing have been addressed in previous studies, most healthcare professionals are unaware of this research. Indeed, 63.1% of those surveyed had ‘little or no knowledge’ of egg sharing at all. The limited knowledge of egg sharing amongst healthcare professionals almost certainly has consequences on the number of referrals made to the programme. Indeed, over 75% of those surveyed in this study had never referred patients for egg sharing. This was particularly prevalent among GPs, with 76.6% citing lack of knowledge preventing them from making the referral. As the first point of contact for women trying to conceive, this could have a significant impact on the amount of time women discover that egg sharing was an option. Referral rates are unsurprisingly much higher among fertility specialists than among GPs and obstetrician and gynaecologists. This is potentially of great significance, as clinics will generally not accept women as egg share donors if they are over 35 years of age, so this delay could result in women not qualifying for the egg share programme.

It is likely there is some association between knowledge of egg sharing and acceptance. Respondents from the fertility field were significantly better informed and also significantly more likely to believe that it should take place than other respondents. They also attached significantly more value to the benefits of the programme, and significantly less to the concerns. Additionally, a number of participants who were more negative or indecisive in their responses commented that they would need additional information to fully support the egg sharing scheme. This survey supports other studies that the legislative changes in April 2005 regarding disclosure of donors identity and information is not a major deterrent to oocyte donation [17,29]. Most respondents agreed that the new legislation represented a positive change, and would not dissuade them from donating their oocytes. Another study found that 65.1% of egg sharers be happy to be contacted by a child conceived with her oocytes, with a further 14% neutral about the idea of future contact [17]. Therefore the low numbers of egg sharers in the UK is more likely due to lack of knowledge about the

programme. It is therefore logical to assume that educating healthcare professionals about the existence of egg sharing and the research relating to it is instrumental in increasing egg sharer recruitment. This would increase patient awareness of egg sharing, but also allow healthcare professionals to address concerns that may prevent potential egg sharers from participating, or even attending a fertility clinic with an initial consultation with a fertility specialist. There is precedent to suggest that increasing knowledge of egg sharing would positively affect uptake, since the HFEA attributes the increase in voluntary oocyte donor registration to a heightened awareness as a result of increased marketing [27]. Implementing a similar strategy may benefit egg sharing, since currently less than 20% of egg share donors find out about the scheme by advertising [21].

Limitations and recommendations for future research

This is the only study to assess health care professionals' knowledge and views of egg sharing. Data was collected from over 300 respondents, which has allowed statistically significant data to be generated. However there were several limitations with this study. First, convenience sampling was used to select respondents, and although this allowed a large number of participants to be recruited, this could have introduced bias. Second, there was disparity between the number of respondents from different professions and specialties, which again is a potential for bias. Third, the questionnaire-based methodology is another limitation, since questions were mainly close-ended, and a small proportion of questions were left unanswered, presumably because of confusion about a question's meaning. By performing face to face interviews, a greater depth of qualitative data could be collected.

Fertility specialists who are involved in the egg sharing programme should conduct workshops, seminars and conferences to educate their peers about egg sharing. Particular targets should be GPs and obstetricians and gynaecologists, as this is the referral pathway patients would usually go through prior to seeing a fertility specialist. Particular focus should be placed on the lack of third party involvement in oocyte donation and access to IVF for women who are ineligible for NHS funded treatment, as these are the most significant benefits identified by the medical community. This study suggests that educating healthcare professionals about egg sharing will improve their perceptions of it. Future studies could investigate how healthcare professionals' opinions of egg sharing could change according to the extent of their knowledge, for example by conducting face to face interview prior to an educational seminar and afterwards. Future research should focus on the psychological aspects of egg sharing on the donor, as it was the most significant issue raised by participants. While evidence from existing studies is reassuring, studies with larger samples of egg sharers and longer follow up would potentially help to sway negative opinions of egg sharing that a minority of healthcare professionals hold.

Conclusions

There is currently an overwhelming lack of knowledge of egg sharing among GPs and obstetricians and gynaecologists that reduces the number of potential egg sharers that are informed of the programme. As a consequence, egg share donor registrations and annual egg sharing cycles have reduced in recent years in the UK. There is overall significant support among the medical community for oocyte donation and egg sharing, although compared to known and voluntary oocyte donation, attitudes towards egg sharing were marginally less positive. The benefits of egg sharing were considered more significant than any potential

issues surrounding it. The greatest areas of concern were the potential psychological effect for the egg share donor and the impact of egg sharing on IVF success rates. Previous studies have shown these issues to be less significant than theorized, so education of healthcare professionals about the egg sharing programme and the research that supports it, could improve healthcare professionals' perceptions of egg sharing and increase egg sharing numbers.

Authors' roles

T.B-M and M-Y.T were responsible for the study design. T.B-M, S.P and S.R were responsible for collecting the data using questionnaires and inputting the data onto the online tool. T.B-M and S.R were responsible for data analysis. T.B-M and M-Y.T were responsible for manuscript design, drafting and revision. S.S, S.C and B.J were responsible for providing important intellectual input into the work and preparation, drafting and final approval of the manuscript. M-Y.T is a fertility specialist and the guarantor of this paper and accepts full responsibility for the work and conduct of the study.

Funding

No external funding was used for this study.

Conflict of interest

The authors have no financial, personal, or professional competing interests to declare.

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