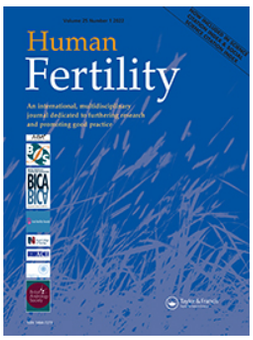

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ORIGINAL ARTICLE

Elective egg freezing and male support: a qualitative study of men's roles in women's fertility preservation

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ABSTRACT

How do men participate in women's fertility preservation decisions and procedures? This binational, qualitative study assessed whether men play supportive roles either before, during or after women's elective egg freezing (EEF) cycles. From June 2014 to August 2016, 150 women (114 in the USA and 36 in Israel) who had completed at least one cycle of EEF were interviewed by two medical anthropologists, one in each country. The majority (85%) of women in the study identified the lack of a male partner as their main reason for pursuing EEF. However, nearly two-thirds (63%) of women relied on some form of male support during their EEF decision making processes and procedures. Five categories of men, in order of support, included: (i) fathers (or other male father figures), (ii) male partners (past or present), (iii) male friends, (iv) brothers and (v) male judges (some of whom supported EEF in divorce settlements). More than a dozen different forms of assistance were offered by men in four major categories: (i) instrumental, (ii) financial, (iii) physical and (iv) psychological. Although one-third (37%) of women went through EEF alone or with only female support, this study reveals the 'hidden' roles men play in supporting the reproductive aspirations of women.

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Oocyte cryopreservation; fertility preservation; elective egg freezing; men in reproduction; USA; Israel

Introduction

Around the world today, healthy women who are hoping to preserve their reproductive potential are increasingly turning to elective oocyte cryopreservation as a form of fertility preservation (Allahbadia, 2016; Hammarberg, 2018; Lallemant, Vassard, Andersen, Schmidt, & Macklon, 2016; Lewis, Missmer, Farland, & Ginsburg, 2016; Milman, Senapati, Sammel, Cameron, & Gracia, 2017; Santo et al., 2017). Elective egg freezing (EEF) – as women themselves prefer to call it (Inhorn, Birenbaum-Carmeli, Birger, et al., 2018; Inhorn, Birenbaum-Carmeli, Westphal, et al., 2018) – is being undertaken by reproductive-age women for a variety of 'social' reasons (Cobo & Garcia-Velasco, 2016; Donnez & Dolmans, 2017; Goldman & Grifo, 2016; Gunnala & Schattman, 2017; Hammarberg, 2018). However, mounting empirical evidence strongly suggests that the primary factor in women's decisions to pursue EEF is the lack of a male partner with whom to pursue childbearing.

Six major surveys of EEF conducted in urban centres around the globe foreground the single status and older age of most EEF users. In a survey conducted in New York City, 88% of 183 women who completed at least one cycle of EEF lacked a male partner, and 84% were aged 35 or older (Hodes-Wertz, Druckenmiller, Smith, & Noyes, 2013). In Brussels, Belgium, 81% of 86 women were single, with a mean age of 36.7 (Stoop et al., 2015), while in Amsterdam, Netherlands, 72% of 228 women were single, at a slightly lower mean age of 34.9 (Balkenende, Dahhan, van der Veen, Repping, & Goddijn, 2018). In Melbourne, Australia, the percentage was even higher, with 90% of 96 women surveyed being single, and almost half (48%) aged 38 or older (Hammarberg, Kirkman, et al., 2017; Pritchard et al., 2017). In London, England, 95% of 389 women who froze their eggs for 'social' reasons were single, at an average age of 37.4 (Gurtin, Shah, Wang, & Ahuja, 2019). And in San Francisco, California, 76% of 201 women surveyed were single, at an average age of 36.5 (Greenwood, Pasch, Hastie, Cedars, & Huddleston, 2018).

Similarly, small-scale, qualitative, interview-based studies of EEF patients carried out in the USA (Brown & Patrick, 2018; Carroll & Kroløkke, 2018), UK (Baldwin, 2017, 2018, 2019; Baldwin, Culley, Hudson, & Mitchell, 2019; Baldwin, Culley, Hudson, Mitchell, & Lavery, 2015; Waldby, 2015, 2019) and Turkey (Göçmen & Kiliç, 2018; Kiliç & Göçmen, 2018) show that most

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women are pursuing EEF in their late 30s and early 40s, primarily because they lack a male partner. For example, in the UK, Baldwin (2017) found that 84% of 23 British women interviewed were single at the time of EEF, although most had hoped to be in a committed heterosexual relationship. Similarly, in their study of 21 Turkish women, Göçmen and Kiliç (2018) found that 100% of their interviewees were single and were pursuing EEF at an advanced mean age of 40.

This 'men as partners' problem (Inhorn, Birenbaum-Carmeli, Birger, et al., 2018; Inhorn, Birenbaum-Carmeli, Westphal, et al., 2018; Wentzell & Inhorn, 2014) has been identified as a critical deterrent to women's reproductive aspirations. In a recent review of men's fertility knowledge, attitudes and behaviours, the authors conclude that the lack of a male partner or a partner willing to commit to parenthood is the main reason for later childbearing among women (Hammarberg, Collins, Holden, Young, & McLachlan, 2017). Even in high-income countries, most men have inadequate knowledge about the limitations on female and male fertility, and thus are putting off their own parenthood aspirations and commitments in ways that may be detrimental to women in the long run (Hammarberg, Collins, et al., 2017; Holton et al., 2016).

Having said this, a growing body of anthropological research from around the world shows that men may, in fact, be very invested in reproduction and supportive of their female partners and family members (Berry, 2010; Galvez, 2011; Han, 2013; Heller, 2018; Inhorn, 2012, 2018). Yet, because men are often marginalised in reproductive health studies (Culley, Hudson, & Lohan, 2013; Law, 2019) – where they are often treated as the 'second sex' (Inhorn, Mosegaard, Tjørnhoj-Thømsen, & Goldberg, 2009) – scholars have missed an important opportunity to explore and characterise the roles that men *do* play in reproduction, including by supporting partners, friends and family members (Hanna & Gough, 2017; Layne, 2010).

Given men's potentially important but unacknowledged roles in reproduction, this study asks: Do men participate at all in women's fertility preservation decisions and procedures? And, if so, what roles do they play? To answer these questions, we specifically explored women's perceptions of male involvement in their EEF decision-making and processes.

Materials and methods

This medical anthropological study was designed to assess the experiences and support systems of women who had completed at least one EEF cycle in the USA and Israel: two countries where clinical approval of EEF occurred early, in 2012 and 2011 respectively. From June 2014 to August 2016, women were recruited from seven IVF clinics, four in the US (two academic and two private) and three in Israel (one academic and two private).

In total, 150 healthy women (114 in the US and 36 in Israel) who had undertaken at least one EEF cycle volunteered to participate in this study. All participants signed written informed consent forms, agreeing to a confidential, audio-recorded interview in a private setting. Interviews usually lasted about one hour, but ranged in length from one-half to more than two. In both countries, an identical semi-structured, but open-ended interview schedule was used to guide the interviews, with the interview schedule being translated into Hebrew in Israel. In the initial semi-structured portion, all women were asked a brief series of socio-demographic questions (i.e. age, place of birth, current residence, education completed, current employment, marital status, ethnicity, religion), as well as relevant details of reproductive history (i.e. age at menarche, contraceptive use, any known reproductive problems).

Following these semi-structured questions, women were then asked a series of open-ended questions focussing on their life circumstances at the time of EEF, their primary motivations for undertaking the procedure and their experiences of EEF itself. Questions were asked about EEF support systems (e.g. family, friends, partners, co-workers), as well as how women had financed their EEF cycles. Women often 'led' the interviews, describing their EEF 'stories', their decision-making processes and their support systems in detail. The qualitative approach of this study was thus person-centred and experiential (Hollan, 2001).

Completed interviews were then transcribed verbatim by trained research assistants, and in Israel, interview transcripts were translated from Hebrew into English by a professional bilingual translator. Following transcription and translation, all interview transcripts were uploaded into a qualitative data analysis software programme (Dedoose, University of California, Los Angeles) for thematic content analysis, using a coding scheme developed by the co-authors. As is usual for qualitative, interview-based research, the main data analytic strategy was to systematically search for and examine themes and patterns emerging from the interview materials and to compare the US and Israeli data. The research protocol was approved by Institutional Review Boards at both Yale University

(IRB Protocol ID: 1303011746) and the University of Haifa (IRB Protocol ID: 118/13) and by the ethics committees of all the collaborating IVF clinic sites.

Results

Women's socio-demographic characteristics

Women's socio-demographic characteristics are shown in Table 1. At the time of EEF, women were 36.3 years on average (36.4 in the US, 36.2 in Israel). Eighty-five percent (82% in the US, 91% in Israel) were pursuing EEF because they lacked a male partner. Even among those who were partnered at the time of EEF (15%), only half were in relationships that they considered stable. Almost all women in the study identified as heterosexual (with the exception of two bisexual American women and one Israeli lesbian). Thus, the vast majority of women were freezing their eggs while still hoping to find a committed male partner with whom to pursue childbearing.

Women in this study were highly educated, with nearly three-quarters (72%) completing postgraduate degrees. Furthermore, in both countries, study participants were ethnically and racially diverse. While 69% of American women were Caucasian, 18% were Asian American, 4% were African American, 3.5% were Latinx, 3.5% were mixed-race and 2% were of Middle Eastern backgrounds. In Israel, 72% of women were Ashkenazi (European) Jews, while 8% were Mizrahi Jews and 20% came from mixed Ashkenazi-Mizrahi backgrounds.

At the time of their interviews, slightly more than half (57%) of the women in the study had completed one EEF cycle, as shown in Table 1. But nearly one-third (31%) had completed two cycles. More than 10% of women (11%) had undertaken three or more EEF cycles. Altogether, these women had experienced more than 230 EEF cycles among them.

Categories of male EEF supporters

Women in this study did not pursue their EEF cycles entirely on their own, given that some aspects of the EEF procedure require assistance or accompaniment (e.g. on the day of egg retrieval). In most cases, that support came from other women. For example, in the US portion of the study, 95% of women received encouragement, help or financial assistance from other women, including mothers, sisters and/or female friends. Friends were cited as especially helpful confidantes and supporters, including infertile female friends, who wished that they themselves had pursued EEF. Similarly, in Israel, approximately half (47%) of women initially learned about EEF from their mothers, sisters or female friends and gynaecologists, and nearly half of all EEF cycles were paid for by mothers and fathers.

As shown in Table 2, the role of men, such as fathers, was critical. Nearly two-thirds (63%) of women

Table 1. Elective egg freezing (EEF) in the USA and Israel: sociodemographic characteristics of study participants.

	USA		Israel		Total	
Characteristics	*n*	%	*n*	%	*n*	%
Age at EEF						
25–29	1	<1	0	0	1	1
30–34	19	17	7	19	26	17
35–39	83	73	27	75	110	73
>40	11	10	2	6	13	9
Total	114	100	36	100	150	100
Number of EEF cycles						
1	65	57	21	58	86	57
2	35	31	11	30	46	31
3	10	9	1	3	11	8
>3	4	3	1	3	5	3
Unrevealed	0	0	2	6	2	1
Total	114	100	36	100	150	100
Relationship status at EEF						
Single	94	82	33	91	127	85
Partnered	20	18	3	9	23	15
Highest degree						
High school	0	.0	1	3	1	1
Associates degree (2 years)	1	1	0	0	1	1
Professional arts performance	2	2	0	0	2	1
Bachelors	23	20	14	39	37	25
Masters	52	45	13	36	65	43
MD	16	14	7	19	23	15
PhD	11	10	1	3	12	8
JD	8	7	0	0	8	5
MD–PhD	1	1	0	0	1	1
Total	114	100	36	100	150	100
Ethnicity						
American women						
Caucasian American	79	69	–	–	79	53
Asian American	20	18	–	–	20	13
African American	5		–	–	5	3.5
Latinx American	4	3.5	–	–	4	2.5
Mixed race	4	3.5			4	2.5
Middle Eastern Heritage	2	2	–	–	2	1.5
Israeli women						
Ashkenazi	–	–	26	72	26	17
Mizrahi	–	–	3	8	3	2
Mixed	–	–	7	20	7	5
Total	114	100	36	100	150	100

Table 2. Categories of men supporting women's elective egg freezing (EEF) in the USA and Israel.

	USA		Israel		Total	
Men supporting women	No.	%	No.	%	No.	%
Fathers (or male father figures)	24	21	24	67	48	32
Male partners (past and present)	37	32	3	8	40	27
Male friends	11	10	7	19	18	12
Brothers	5	4	3	8	8	5
Male judges	3	3	0	0	3	2
Multiple male supporters[a]	12	11	0	0	12	8
Women supported by men	66	58	28	78	94	63

[a]These columns do not add up to 100%, because some American women had multiple forms of male support.

in this study received support from men, who comprised five different categories as follows:

Fathers (or male father figures) (32%)

Nearly one-third of women had supportive fathers (or men who served as father figures, including stepfathers and uncles). Israeli fathers were particularly involved in their daughters' EEF processes, with two-thirds (67%) of Israeli women citing fathers' support for EEF. Nearly half (47%) of Israeli fathers (and mothers) paid for their daughters' EEF cycles, usually in full. In the US, only one-fifth (21%) of women mentioned their fathers as EEF supporters. However, paternal support took interesting forms. For example, one scientist father developed a 'mathematical algorithm' to help his daughter calculate her chances of EEF success, while another father, described by his daughter as a 'very old-fashioned Southern gentleman', provided emotional support when his daughter burst into tears over her anti-Mullerian hormone (AMH) results. In general, when informed about their daughters' desires to pursue EEF, fathers in both the US and Israel were emotionally supportive. Indeed, no father was described as placing undue pressure on his daughter to produce grandchildren through EEF procedures.

Male partners (past and present) (27%)

Although most women going through EEF in this study did not have male partners, 15% did (18% in the US, 9% in Israel). In such cases, women's partners – whether husbands, cohabitating partners or new boyfriends – were often the main supporters of EEF. Women in marriages or long-term relationships often described their partners as 'very supportive', even 'gung-ho'. As one woman explained, 'He just thought that [EEF] was the most brilliant thing! He loved it!' Furthermore, new partners were often solicitous, with EEF being described by women as a 'bonding moment'. Six American women went on to marry their EEF-supporting partners, while in 10 other cases, relationships ended after EEF. Even after breakups, ex-husbands and former boyfriends could be supportive; more than one-quarter (27%) of women in this study received some kind of (ex)partner support during the EEF process, from financial assistance to 'TLC'.

Male friends (12%)

Women in both countries also relied on male friends, with whom they were not romantically involved. Women remarked that casual male friends and co-workers could be quite supportive, calling EEF 'a smart thing to do'. Close male friends often provided instrumental EEF support, sometimes offering to pay for EEF cycles, to loan money or to accompany women to clinics. In clinical settings, male friends were often mistaken for husbands. But despite this confusion, women who had close male friends were often grateful for their EEF support.

Brothers (5%)

As with male friends, brothers sometimes encouraged their sisters to pursue EEF and provided them with various forms of emotional and instrumental support. Indeed, brothers sometimes saw their fraternal role as caring for their sisters and relieving their sisters' stress. For example, one American woman, who described herself as 'petite' and her younger brother as a 'big guy', explained how he offered to carry her out of the clinic on the day of the egg retrieval, if she needed his physical support. He also constructed a playlist of 'happy songs' to keep her in high spirits. In another case, a younger brother in medical school moved in for two weeks to make sure his older sister was well cared for during her EEF cycle.

Male judges (2%)

A final form of male EEF support – one that may increase substantially over time – comes from male judges. In the US, some judges are now ordering ex-husbands to pay for EEF cycles as part of their divorce settlements. Nineteen American women in this study were divorced or divorcing at the time of EEF. In three of these cases, male judges helped women to obtain EEF cycles. To take one example: an emergency room physician who was undergoing a contentious divorce was accused of 'lavish spending' by her husband's attorney. When she explained to the older male judge that she had been paying for an EEF cycle, he took her side, telling the ex-husband's attorney, 'I don't think her wanting to be a mom and trying to do this is wasteful'. This woman was very grateful for the judge's support:

> Thank you judge, for standing up for me! I'm not throwing money away. And it's not fun. It's not like I'm putting myself on a cruise ship, you know? I'm sticking myself with needles and going to doctor's office appointments at 6 in the morning, when I've been up until 3 in the morning the night before, you know?

Forms of male EEF support

As seen in these different scenarios, forms of male support are quite varied, ranging from immediate,

Table 3. Categories and types of male support for women's elective egg freezing (EEF) in the USA and Israel.

	USA		Israel		Total	
Categories and types of support	No.	%	No.	%	No.	%
Instrumental						
Seeking/providing information	1	1	2	6	3	2
Referring to helpful others	1	1	0	0	1	1
Attending appointments	2	2	0	0	2	1
Offering sperm (to make embryos)	3	3	0	0	3	2
Totals	7	7	2	6	9	6
Financial						
Analyzing/budgeting costs	2	2	0	0	2	2
Paying (for all or part)	13	11	17	47	30	20
Offering to pay	7	6	0	0	7	5
Loaning money	3	3	0	0	3	2
Ordering EEF as part of divorce settlements	3	3	0	0	3	2
Totals	28	25	17	47	45	31
Physical						
Assisting with injections	6	5	1	3	7	5
Accompanying to and from egg retrieval	24	21	5	14	29	19
Providing post-retrieval food and care	6	5	0	0	6	4
Totals	36	31	6	17	42	28
Psychological						
Suggesting EEF	1	1	4	11	5	3
Encouraging EEF	10	9	4	11	14	9
Providing emotional support	12	10	6	17	18	12
Providing entertainment/humour	2	2	0	0	2	2
Totals	25	22	14	39	39	26
Total acts of male support	96	84	39	>100	135	90

practical assistance (e.g. a car ride from a clinic) to future-oriented support for a woman's right to motherhood. As shown in Table 3, more than a dozen different types of male support were identified in this study, falling into four major categories as follows:

Instrumental

Instrumental forms of support involved informational and practical assistance. In the information-gathering stage of EEF, men sometimes helped women with Internet research on EEF, or referred them to other women in their networks. Men sometimes accompanied women to EEF clinic appointments. And, in the most instrumental form of support, a few men offered women their sperm, just in case they decided to seek a donor.

Financial

The most significant category of assistance was financial, with nearly one-third (31%) of women receiving some form of payment, usually from parents. This was especially true in Israel, where, as mentioned earlier, fathers and mothers paid for nearly half of all EEF cycles. This was not true in the US, where most women were highly paid professionals and could pay for EEF on their own. Still, in 20% of cases, parents either paid, offered to pay or loaned money to their daughters, with some of these offers coming directly from fathers rather than mothers.

Physical

All women in this study had needs for physical support – sometimes injection assistance, but primarily accompaniment on the day of egg retrieval. Most IVF clinics require women to be accompanied home after receiving anaesthesia and securing such accompaniment can be difficult. This was especially true for American women, who often lived at a distance from family members. In one-fifth of the American cases, fathers, (ex)partners, male friends or brothers accompanied women on egg retrieval day – taking off work, flying across country or making formidable drives, including in inclement weather. A few men also cared for women after EEF, cooking for them, bringing in meals, 'checking up' and providing various forms of entertainment.

Psychological

Psychologically, the role of male support cannot be underestimated. In this study, about one-quarter of women received significant psychological support from men. Men were sometimes the ones to suggest or encourage EEF, and to express enthusiasm and commitment once EEF decisions were made. As one American woman explained, her physician father and younger brother were 'even more excited than I was!' Another woman described how her male partner (now husband) expressed pride in her: 'He thought of me in a pioneer kind of way. He actually thought it was a very empowering, cool thing that I did'. As suggested by these statements, some women received significant psychological support, sometimes from multiple men. Furthermore, some men provided multiple forms of male support (e.g. payment and accompaniment). Thus, as shown in Table 3, the total number of supportive male acts was higher than the number of women in the study, particularly in Israel.

Discussion

These findings from 150 American and Israeli women are telling: namely, they reveal the supportive but largely unacknowledged roles men are playing in the EEF process. Even though most women pursue EEF in the absence of a male partner, men are not absent overall. In this study, men provided crucial support in nearly two-thirds (63%) of all cases. Women's fathers were their primary supporters, but so were (ex)partners, male friends, brothers and sympathetic male judges (in that order). Together, these men provided more than a dozen types of supportive services,

comprising four major categories of instrumental, financial, physical and psychological support.

Interestingly, these categories of male support differed somewhat between the two countries. In Israel, fathers were more likely to provide full or partial financial support for their daughters' EEF cycles, whereas women in the US tended to pay for their EEF cycles on their own. However, women in the US tended to have more categories of supportive men invested in their EEF journeys, and these men provided a wider range of supportive services, from attending appointments to caring for women at home on the day of retrieval.

It is important to note that these reports of male involvement were derived entirely from interviews with women, as men were not interviewed directly. Several other limitations of this study bear mentioning. For one, the overall number of participants recruited in the two countries was unequal, reflecting the difference in population size and hence the smaller number of EEF patients recruited in Israel. In addition, women in both countries were recruited from a relatively small number of cities and states, limiting the generalizability of the findings. Furthermore, because this was a binational study, coordinated between researchers and clinics in the US and Israel, the women who participated were recruited somewhat differently and interviewed by different medical anthropologists in two different languages.

Having said this, our study is the first to speak to the importance of male involvement in EEF. Although one-third (37%) of women in our study went through EEF alone or with only female support, two-thirds did not. In most cases, men played key supportive roles in women's EEF decision making and experiences. Although male support for EEF remains largely 'hidden' at the present time, it constitutes a new and important form of male participation in the reproductive futures of women about whom men care and love.

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