Reproductive BioMedicine Online (2013) **27**, 225–235

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SYMPOSIUM: MEN, FERTILITY AND ASSISTED REPRODUCTIVE TECHNOLOGIES
REVIEW

Where are all the men? The marginalization of men in social scientific research on infertility

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Abstract There is a wealth of research exploring the psychological consequences of infertility and assisted reproduction technology, a substantial body of sociological and anthropological work on 'reproductive disruptions' of many kinds and a small but growing literature on patient perspectives of the quality of care in assisted reproduction. In all these fields, research studies are far more likely to be focused on the understandings and experiences of women than those of men. This paper discusses reasons for the relative exclusion of men in what has been called the 'psycho-social' literature on infertility, comments on research on men from psychological and social perspectives and recent work on the quality of patient care, and makes suggestions for a reframing of the research agenda on men and assisted reproduction. Further research is needed in all areas, including: perceptions of infertility and infertility treatment seeking; experiences of treatment; information and support needs; decisions to end treatment; fatherhood post assisted conception; and the motivation and experiences of sperm donors and men who seek fatherhood through surrogacy or co-parenting. This paper argues for multimethod, interdisciplinary research that includes broader populations of men which can contribute to improved clinical practice and support for users of assisted reproduction treatment.

KEYWORDS: assisted reproduction technology, infertility, interdisciplinary, masculinity, men, psycho-social

Introduction

There has been a wealth of research exploring the psychological consequences of infertility and assisted reproduction technology, a substantial body of sociological and anthropological work on 'reproductive disruptions' of many kinds and a small but growing literature on patient perspectives of the quality of care in assisted reproduction. In all these fields, research studies are far more likely to be focused on the understandings and experiences of women than those of men. This paper builds upon a recent overview of the literature on the psychological and social aspects of infertility in men (Fisher and Hammarberg, 2012) by highlighting the particular need for a greater breadth in social science research

1472-6483/$ - see front matter
http://dx.doi.org/10.1016/j.rbmo.2013.06.009

on gender and infertility. This paper discusses reasons for the relative exclusion of men in what has been called the 'psycho-social' literature on in/fertility, comments on research from psychological and social perspectives and recent work on the quality of patient care, and then makes suggestions for reframing the research agenda on men and infertility. It argues for research which goes beyond a somewhat pathologizing focus on measuring gender differences in stress, anxiety and depression amongst women and men in relation to infertility and suggests a need to explore: broader and deeper understandings of how men as well as women experience and live with infertility over both the short- and long-term; how men experience fertility care and how they appraise the care they receive from clinicians; and how men subsequently experience fatherhood through fertility treatments, again over the long term. The paper discusses some of the methodological limitations of current studies in both psychological and social research and argues for stronger interdisciplinary research which incorporates the experiences of men from a broader range of populations. Such an approach would help to develop an improved understanding of ethnic, social class, sexuality and life-course factors that affect men's experiences of infertility/fertility and would also enhance an understanding of how cultural contexts shape both women and men's notions of infertility and their responses to the challenges that infertility and its treatment present.

The 'second sex' in reproduction: Why so few?

Women's reproductive lives have been extensively explored by social science research in the last 25 years. However, whether heterosexual or homosexual, married or unmarried, fertile or infertile, men are the 'second sex' in reproduction research. As Inhorn (2012) have forcefully argued, the marginalization of men is an oversight of considerable proportions. Not only is relatively little known about men's reproductive concerns, reproductive decision making and reproductive experiences, there is also little understanding of how men contribute to women's reproductive decisions and their reproductive health (Dudgeon and Inhorn, 2004). Infertility is widely conceptualized, like reproduction more generally, as a woman's problem. Yet, the biological reality, of course, is that in a substantial proportion of couples, male problems are the sole or contributing factor to infertility (National Collaborating Centre for Women's and Children's Health, 2012; Skakkebaek et al., 1994). Even in the absence of a male factor, men in couples with fertility problems are keen to conceive as childbearing is also part of their normative expectations (Marsiglio et al., 2013).

One of the main reasons for this lack of understanding infertility in men's lives is the cultural importance of reproduction in women's lives. Reproduction is still centred on women and put on the agenda as if it were central to all women's lives. These normative assumptions about the significance of childbearing for women and the corresponding tendency for reproduction, contraception and childbirth to be inextricably linked with femininity can lead to the burden of responsibility in relation to reproduction being placed largely upon women. In addition, these assumptions marginalize men in terms of both rights and responsibilities in planning and preparing for parenthood and for rearing children (Annandale and Clark, 1996; Bordo, 2004; Delphy and Leonard, 1992; Lorber, 1994; Sabo and Gordon, 1995).

A further reason for the lack of research into men and infertility has been the biological and clinical focus on women's bodies in relation to both the diagnosis and treatment of infertility in both reproductive science and clinical practice (Clarke, 1998; Laborie, 2000; Meerabeau, 1991). The fact that, whatever the diagnosis, current clinical practice of assisted reproduction largely works on the female body to improve the woman's chance of becoming pregnant and sustaining a pregnancy has also guided social scientists to read this as a woman's medical story to tell. Similarly in clinical practice, while the couple may be present in the clinical encounter, the primary clinical relationship is developed with the woman and the clinical file is usually her clinical file. Women's bodies are the focus of most medical interventions and this serves to further re-enforce the exclusion of men's perspectives and the perception of men's contribution as performing 'traditional' masculine roles of the 'emotional rock' for women and the 'rational veto' on treatment decisions (Throsby and Gill, 2004). In a clinical context in which assisted reproduction is primarily seen to be operationalized on women's bodies, men's needs and concerns may be effectively silenced. An alternative discourse to men acting in a 'supportive' role may be difficult for men to articulate. As will be discussed further, this relative marginalization of men is decreasing as men's bodies are increasingly brought into the clinical sphere through treatments such as intracytoplasmic sperm injection, and the historical secrecy surrounding issues such as sperm donation and donor insemination are decreasing.

Finally, there is the issue of the logistical and methodological challenges of including men in infertility research. Since reproduction is centred on women, it may be more difficult to engage male non-treatment seekers in research exploring desire for children, childbearing intentions and understandings of infertility (although clearly some are successful in this, see for example Daniluk, 2001; Daniluk and Koert, 2012; Roberts et al., 2011). In the clinic, because of the focus of treatment on women's bodies, men are less often available for convenience samples and may not respond as readily as women to requests to participate in fertility research. It is often assumed (but seldom actually established) that men's non-response relates to the 'sensitivity' of male infertility, although there is little evidence that participation relates specifically to diagnosis (Lloyd, 1996). Alternatively, it could be that men are more inclined to resist the (questionable) depiction of the infertile as vulnerable 'patients', 'suffering' from emotional distress (Sandelowski and de Lacey, 2002) or the intrusive and potentially iatrogenic effects of psycho-social research (van Balen, 2002).

However, despite these challenges, there are signs of change in the gender bias in research on reproduction more generally. In particular, many societies are experiencing a cultural transformation of fatherhood towards the contemporary ideal of the engaged, nurturing father. There is an expectation that men will be involved in preparing for childbirth and in equal co-parenting, and social science research has shed light on this changing role (for example, Barclay and Lupton, 1999; Dermott, 2008; Featherstone, 2009; Henwood and Procter, 2003; Hobson, 2002; La Rossa, 1997;

Lewis and O'Brien, 1987; Lupton and Barclay, 1997; Miller, 2011). Nonetheless, it has been difficult to open up an understanding of men's preparations for fatherhood, including men's desires for children, men's awareness of their fertility/infertility and their efforts to conceive a child. Much less has been written on men's participation in reproductive planning and on men's reproductive desires, or what has been referred to as men's 'procreative consciousness' (men's subjective experiences related to reproductive issues) and 'procreative responsibility' (men's sense of obligation regarding issues such as contraception and pregnancy resolution) (Marsiglio, 1993; Marsiglio et al., 2001, p. 124; Marsiglio et al., 2013).

One example of this gap is in the topical concern with a trend for later childbearing. Internationally, the decline in birth rates and rising maternal age at primigravida is perceived as a social problem associated primarily with women's desire and need to work in the labour market (Bewley et al., 2005). The role that men play in the process of delayed childbearing (often discussed as delayed motherhood) is poorly understood. Little is known about men's fertility decision making or how men's intentions and actions impact both positively and negatively (directly and indirectly) on women's fertility decision making (Jamieson et al., 2010). Although there is evidence that men desire parenthood (Hadley and Hanley, 2011; Lohan et al., 2011; Throsby and Gill, 2004) and expect to become fathers later in life (Daniluk and Koert, 2012; Lampic et al., 2006; Roberts et al., 2011; Thompson and Lee, 2011; Tough et al., 2007), little is known about the trend for older fatherhood or about men's contribution to low fertility and wider social change in families and relationships (Jamieson et al., 2010).

Another significant gap in the literature on men and assisted reproduction concerns those men who are not themselves infertile or part of an infertile couple, but who are engaged with assisted reproduction technology as sperm donors or as men seeking parenthood outside of a heterosexual relationship. A recent systematic review of sperm donors analysed just 29 papers from nine countries. Most of these used questionnaires but often had very small (convenience) samples. There is almost no in-depth information about the experience of being a donor and an absence of follow-up research (van den Broeck et al., 2013). There is also a growing trend for single men and gay couples to seek parenthood via surrogacy, but very few studies of such men's engagement with assisted reproduction (Norton et al., 2013).

Men, psychology and infertility

Many disciplines, such as nursing, psychology, sociology, anthropology and social work, have contributed to the study of non-medical aspects of infertility. However, in infertility journals and scientific meetings which include psycho-social research, the emphasis is very clearly on the psychological rather than the social (Crawshaw, 2013). Infertility is primarily constructed as a medical condition with psychological consequences (Greil et al., 2010).

While psychogenic explanations of infertility have lost ground in the past 50 years (although not entirely disappeared), the psychological consequences model, and in particular the psychological consequences of IVF and related treatments, have been widely studied. The majority of studies of the psychological impact of infertility and its treatment have been carried out with women. A recent review concluded that there is in fact little evidence of increased psychopathology for infertile women (Boivin et al., 1999), although a recent Danish cohort study suggested an increased risk of psychiatric disorders in women who do not give birth following fertility treatment compared with those who do (Baldur-Felskov et al., 2013). Emotional distress in infertile patients is more commonly reported, although it is difficult to distinguish between the impact of infertility and the impact of treatment.

Several review papers quote studies which suggest that women suffer greater levels of distress than men (Chachamovich et al., 2010; Henning and Strauss, 2002; Savitz-Smith, 2003) and also conclude that there are gender differences in coping strategies (Jordan and Revenson, 1999; Schmidt et al., 2005). However, recent studies with more sophisticated designs suggest that men undergoing infertility treatment experience similar levels of distress to women (Peronace et al., 2007). Furthermore, a recent large-scale comparative European study of older childless people (n = 24,195) found that the overall psychological disadvantage of being childless is stronger for men than for women (Huijts et al., 2013).

Thus the evidence for gender differences in the impact of infertility and its treatment is far from conclusive. Edelmann and Connolly (2000, p. 365) argue that the suggestion that women experience greater distress than their partners with regard to infertility treatment is illusory. It is 'overly influenced by outdated gender stereotyping and is unsupported by research data'. A similar argument is made by Fisher et al. (2010), who studied men 5 years after diagnosis of infertility.

Whether or not there are significant gender differences in the impact of infertility and its treatment, it is evident that men are emotionally affected by infertility. While there is little evidence of clinically significant levels of anxiety, there is clearly evidence of social and psychological strain among male infertility patients (Dooley et al., 2011; Wischmann and Thorn, 2013), although reports of distress do not always distinguish between men who are diagnosed as infertile or subfertile and men who are part of an 'infertile couple', that is, men who do not themselves have a fertility problem.

Psychological studies of distress whether in women, men or couples are primarily quantitative in design, using standardized generic psychological assessment instruments (Greil, 1997; Greil et al., 2010). Studies are often based on clinic samples making it difficult to sort out to what extent distress is the result of the condition of infertility itself and to what extent it is an effect of infertility treatment (Greil, 1997; Greil et al., 2010; McQuillan et al., 2011). Evidence characterizing infertile women as highly distressed and totally immersed in the process of trying to become pregnant applies primarily to treatment seekers (Greil and McQuillan, 2004; Jacob et al., 2007) and thus does not capture the experiences of the substantial numbers of women and men who do not seek treatment (White et al., 2006). Most studies are cross-sectional in design, thus making it impossible to permit clear causal inferences or to

understand the potentially dynamic impact of infertility as a process. In addition, critics point out that the generic measures commonly used in such studies may not be sufficiently sensitive to the problems of the infertile (Greil et al., 2010; Schmidt, 2009), although a fertility-specific tool is now available (Boivin et al., 2011). It could also be the case that such measures need to be adapted to encompass issues relevant to men. Studies which focus on both men and women as a couple often fail to take into account the relational, dyadic context of 'stress' and 'coping' (Schmidt, 2009). Nevertheless, psychological studies have major methodological advantages. Sample sizes in quantitative psychological studies may be substantial and replicable, so statistical analysis using validated measures can identify some highly significant correlations within the treatment-seeking group.

The mixed results of psychological studies which have included men may relate to differences in diagnosis, age, the sensitivity of instruments, the point at which the measures are administered, the stage of treatment and to differences in the socio-cultural context. The latter is the specific domain of social research.

Social research on men and the experience of infertility

Sociologists would argue that distress should not be seen as an essential, fixed construct which may or may not be manifested in any given sample of men. In contrast to a reductionist concept of distress, sociologists argue that the very notion of distress is socially constructed and will thus be a different entity, or at least differently manifested, in different socio-cultural settings. 'Distress' is related to social norms, personal and social expectations and wider cultural and religious ideas about masculinity/femininity and fertility/childlessness. One would expect therefore to see differential levels and forms of 'distress' in different cultural settings, and there is some evidence even in psychological studies that this is indeed the case (Baluch et al., 1998; Folkvord et al., 2005).

Sociologists argue that infertility is also a contested concept. While most infertility studies utilize Western biomedical definitions, it is also evident from sociological and anthropological work that people may have a very different understanding of what constitutes 'infertility' (Greil and McQuillan, 2004) which may at least partially account for the large number of women who fit the bio-medical definition but do not seek treatment (Boivin et al., 2007; Greil and MCQuillan, 2004; White et al., 2006). Ethnographic work in minority ethnic groups in the West (Culley et al., 2009; Hampshire et al., 2012) and in less-developed societies (Gerrits, 1997; Mumtaz et al., 2013; Nahar, 2007, 2012; Reissman, 2000; Inhorn and van Balen, 2002) demonstrates the fluid and contextual understandings of what counts as infertility. For example, in pro-natalist, highly patriarchal cultures, not having a male child may be considered as a form of 'social infertility' (Pashigian, 2002) and in cultures where children are expected to follow marriage in quick succession, failure to conceive within 6 months may be perceived as highly problematic. Currently however, these works exploring the meaning of infertility are focused almost exclusively on women, so there is very little awareness of how men in such societies (or indeed elsewhere) understand 'infertility' (Glover et al., 2009; Purewal and van den Akker, 2007).

There are few qualitative studies of men's procreative desires, their understandings of infertility, feelings about childlessness or experiences of infertility and its treatment (Greil et al., 2010; Marsiglio et al., 2013). Most discussion has concentrated on the medicalization of women's bodies and the impact of assisted reproduction technology on women's lives, drawing on feminist theory in particular (Thompson, 2002). In the crucial exploration of women's experiences and the important work in unmasking the way in which assisted reproduction has tended to reproduce traditional gender inequalities, the issue of masculinity has been sidelined.

The few social studies of infertility that focus on men suggest that infertility is a major life crisis for men as well as women and it is argued that men suffer from an additional and gender-specific set of difficulties associated with a perceived threat to their masculinity, largely related to the linking of masculinity with potency and virility, indexed by 'fathering' a child (Becker, 2000; Daniluk, 2001; Greil, 1991; Meerabeau, 1991; Nachtigall et al., 1992; Throsby and Gill, 2004; Webb and Daniluk 1999). In Malik and Coulson's (2008) study of men using an online support group bulletin board, men reported experiencing a range of negative emotions and difficulties as a result of infertility, although they felt that they had to suppress the anxieties and distress they were experiencing for the sake of their partner. Moreover, they reported feeling sidelined and marginalized in the treatment process and in the way fertility professionals responded to them. Similar findings emerge from an earlier study of men by Meerabeau (1991) and a small-scale comparative ethnographic study of men's experience in the therapeutic process in Israel and Canada (Carmeli and Birenbaum-Carmeli, 1994). This last study also suggests that, even when included in the diagnostic process and treatment, the male's part is not unproblematic, referring specifically to the difficulties of producing semen samples and the stress of potential cancellation of cycles. Furthermore, men with male fertility problems are distressed not only by the impact on their masculinity but by the fact that they feel they have inflicted the pain and distress of infertility treatment on their partners.

In seeking to understand the significance of 'masculinity' for men's experiences of reproductive health, a theoretical orientation known as Critical Studies of Men and Masculinities (CSM) provides useful insights within the sociology of gender (Kimmel et al., 2005). An important concept for understanding men and infertility here is that of 'hegemonic masculinity' (Carrigan et al., 1985; Connell, 1995; Connell and Messerschmidt, 2005). This shows how pervasive masculine norms (such as control, stoicism, strength) can impact on the emotional wellbeing of men who do not live up to these cultural ideals. This concept also alerts researchers to differences in what it means to be masculine within and between cultures, for example differences between highly educated, high-income men and those with poorer education and income opportunities (Dudgeon and Inhorn, 2003). Thus, it guides researchers to look for notions of masculinity that are pervasive as well diverse notions of mascu-

linity which are open to challenge in the stories men tell of themselves. These ideas, derived from sociological and anthropological theories of gender, have begun to influence authors working in the field of infertility (Goldberg, 2009; Hinton and Miller, 2013; Hudson and Culley, 2013; Inhorn and Wentzell, 2011; Machado and Remoaldo, 2009; Moore, 2009; Tjørnhøj-Thomsen, 2009; Wu, 2011).

A further major contribution from sociology and anthropology has been to highlight the importance of exploring men's experience of infertility in differing social, cultural and political contexts (Inhorn et al., 2009a). There are a small number of studies of men and infertility in non-Western societies (see Dhont et al., 2010; Dyer et al., 2004; Mehta and Kapadia, 2008; Yusuf et al., 2012) and a few studies which have included men from minority ethnic groups in high-resource countries (Culley et al., 2006; Culley and Hudson, 2007, 2009; Inhorn et al., 2009b; van Rooij and Korfker, 2009), mostly demonstrating a high degree of stigma attached to childlessness and to male infertility. Inhorn's work on Islam and infertile couples in the Middle East (Dudgeon and Inhorn, 2004; Inhorn 1994, 1996, 2002, 2003a,b, 2006, 2007, 2009, 2012; Inhorn and Birenbaum-Carmeli, 2008; Inhorn, 2012, 2010; Inhorn and Wentzell, 2011) demonstrates the massive impact of the socio-cultural and especially the religious environment on men's feelings about infertility, their experiences of living with infertility and their treatment choices in highly patriarchal societies.

Inhorn's more recent work has challenged the view that men escape the negative physical consequences of infertility (Inhorn, 2012). She argues that 'the earlier feminist credo that only women's bodies are violated in IVF — while men's bodies go ''untouched'' — is no longer legitimate in the new era of assisted conception at the turn of the century'. The new assisted reproduction treatments involve both 'psychic trauma for some men who are unable to successfully ejaculate through masturbation, and physical trauma for others, whose testicles are poked and prodded', for example in the process of sperm extraction for intracytoplasmic sperm injection (Inhorn, 2007, pp. 49—50). This is a grossly understudied area, and research which explores these important issues is one of the major challenges for contemporary infertility research with men.

It is striking that so little is known about how men experience the clinic, even in relation to procedures that are uniquely related to them such as providing semen samples and surgical sperm extraction. Relatively few social studies include the ways in which men experience infertility treatment (but see Becker, 2000; Dancet et al., 2010b; Gorgy et al., 1998; Nachtigall et al., 1992). Thompson's ethnographic study of the 'ontological choreography' of processes of assisted reproduction describes the dynamic coordination of the technical, scientific, kinship, gender, emotional, legal, political and financial aspects of assisted reproduction clinics and includes a consideration of the place of men. She argues that men are often reduced to an 'ejaculatory extension' to their female partner (Thompson, 2005, p. 128). Men are sometimes physically excluded from aspects of the treatment of their partners (during physical examinations, for example), are effectively denied understanding of medical procedures by virtue of the limited interaction they have with these and are less influential in planning the course of treatment than their female partners (Carmeli and Birenbaum-Carmeli, 1994).

While often being able to offer detailed, in-depth accounts of men's experiences, qualitative sociological and anthropological studies also have significant methodological limitations. Although contributing rich data, they are often based on small, non-generalizable samples with constraints on external reliability and validity (Fisher and Hammarberg, 2012). Social studies also focus mainly on treatment seekers, although there is more consideration of the social context of 'infertility' and potential impact of this on men. In the context of high-income countries, such studies, like those in psychology, also are generally restricted to exploring the experiences of a relatively narrowly defined section of the population (Culley et al., 2009). To address this gap, the scholarship requires larger, comparative qualitative studies although such studies are more difficult to fund and conduct. There needs to be less reliance on convenience and snowball-sampling techniques (however purposeful) and greater use of quota samples to enhance the diversity of participants and the generalizability of findings, as well as enabling subgroup analyses.

Men's perceptions of fertility treatment

Men's perceptions of the quality of fertility care and the interaction of men with physicians and other clinic staff are further neglected issues. A recent systematic review of studies of patient perspectives of fertility care (Dancet et al., 2010a) found just one study which focused on men, and this was related to surgical sperm retrieval (Gorgy et al., 1998). The published literature suggests that the concept of patient-centred care is relatively weakly developed in infertility practice and that the agenda of user involvement in service design has not made a significant impact on infertility care at the present time (Dancet et al., 2010a, 2011; Huppelschoten et al., 2012). Recent significant developments have been the development of a quantitative instrument to measure patient-centredness in fertility care, PCQ Infertility, derived from qualitative research with women and men (van Empel et al., 2010) and a gender-sensitive analysis of the organizational determinants of positive patient-centred fertility care (van Empel et al., 2011), both studies conducted in the Netherlands. However, there is a continued dearth of in-depth qualitative research with men that is linked to informing patient-centred care.

Going forward

This paper has argued that there are many gaps in the knowledge of men, infertility and assisted reproduction technology. Further research is needed in all areas including: men's perceptions of infertility and infertility treatment seeking; men's experiences of treatment; their information and support needs; men's decisions to end treatment; fatherhood post assisted conception; the motivation and experiences of sperm donors and of men who seek fatherhood through surrogacy or co-parenting. It is possible to suggest some guiding principles for approaching this important work.

First, we should consider undertaking more studies which can combine the advantages of different methodological approaches. There is undoubtedly much to be gained from psychological and social research pursuing their unique but related interests in men and infertility. However, perhaps the value and challenges of bringing together the 'two worlds' of infertility research should be explored (Greil et al., 2010). In particular, the above discussion has shown, and others have discussed in more detail, the major division between quantitative and qualitative research traditions (which broadly, but by no means completely, map onto psychological versus social studies), both of which offer valuable knowledge, but which rarely 'speak' to each other (Greil, 1997; Greil et al., 2010). To some degree of course, this divide manifests fundamentally different and potentially incompatible ontological and epistemological assumptions, competing political interests and agendas and different research questions (Bryman, 2006). However, some integration of approaches and of methodologies may provide a useful way forward for studying some aspects of men and in/fertility. A consideration of enhanced interdisciplinary or even transdisciplinary work (Gray, 2008; Rosenfield, 1992) which takes seriously the biological, the psychological (individual/couple approach) and the sociological (socio-cultural) dimensions of infertility may provide a fruitful way to study men as procreative 'in their own right' and to explore the impact of gender relations on the infertility experience of both men and women (Crawshaw, 2013). Researchers need to explore in more depth the experiences of men who remain involuntarily childless following fertility treatment and heterosexual and gay men who are currently fathering in families created by assisted reproduction technologies (Blake et al., 2012; Golombok et al., 2004; Norton et al., 2013).

This presents many methodological challenges. However, the use of mixed methods is one way of approaching a research agenda on men and infertility. Mixed methods research in the social sciences primarily has a pragmatic philosophy which draws on employing 'what works', using diverse approaches, giving primacy to the importance of the research problem and question and valuing both objective and subjective knowledge (Tashakkori and Teddie, 2010). Problems most suitable for mixed methods are those in which the quantitative approach or the qualitative approach, by itself, is inadequate to develop multiple perspectives and a complete understanding about a research problem or question. For example, quantitative outcome measures such as those used in quality of life studies may be more comprehensible in combination with qualitative data which could provide an understanding of how the measures were interpreted by research participants. Alternatively, qualitative exploration may usefully contribute to the development of quantitative measures. Nested qualitative work is increasingly advocated as an important element of clinical trials (Donovan et al., 2002). This could include a consideration of gender differences in interpretation of instruments and a need to tailor investigations to encompass the needs and interests of men. Mixed methods research has grown considerably in sophistication in recent years and is now widely used in health-related research more generally (Plano Clark, 2010) although there are relatively few examples in infertility research. Applied in a gender-sensitive way, this approach may illuminate gendered preferences for different styles of research.

Second, research on men would benefit not only from the input of academics from different disciplines, but also from collaborations between researchers and non-academic groups with a stake in the problems under investigation, in this case fertility clinicians, nurses, counsellors, infertility support groups and service users, depending on the specific research question being addressed. While clinical outcomes are clearly of vital importance to men, how they experience treatment and how they feel about it are relevant. In most countries, there is a growing political agenda to involve users in service design and improvement and a range of models of collaboration are proposed (Crawford et al., 2002). There is much to be gained in improving patient care from listening to men, beyond the patient satisfaction questionnaire. One notable study of surgical sperm extraction in a Belgian clinic serves as an excellent example of several of the points made here. This study used both qualitative and quantitative methods to identify strengths and weaknesses in the care related to the procedure. From this, several improvements to clinic practice were introduced (Dancet et al., 2010b).

Third, while this work has argued for research which focuses on men, an important principle concerns the need for studies to also take account of social differences between men. To focus just on the issue of gender ignores the fact that men are also impacted by ideas and structures derived from other axes of social difference, including age, social class, ethnicity/race and sexual orientation. One of the important potential contributions of social science to infertility research is to explore the intersections of gender, class, ethnicity and sexuality (Lohan, 2007) and to see the category 'men' as internally differentiated. This work has highlighted the importance of the concept of masculinity, but the diverse forms of masculinity in infertility (within and between cultures) have not been empirically explored (Birenbaum-Carmeli and Inhorn, 2009; Inhorn, 2012). It cannot, for example, be assumed that the experiences of minority ethnic men are the same as those from majority communities, nor that the needs and interests of gay men will be met by services which are orientated primarily towards heterosexual men and couples.

In all disciplines, studies in high-income countries which include men are predominantly carried out with heterosexual, partnered, well-educated men from dominant ethnic groups (Culley, 2009). Infertility research is socially and ethnically exclusive, and it is important to understand this in more depth. Does this reflect socioeconomic or ethnic differences in the patient populations from which most studies are drawn, or are certain patients less likely to participate in studies? There is little evidence of an ethnic or class difference in the prevalence of infertility although prevalence studies do not always include socioeconomic data and rarely report ethnicity (Culley, 2009; Povey et al., 2012). In any case, estimates of male infertility or semen quality at the population level are hampered by the well-reported reluctance of men to provide semen samples unless currently concerned about their fertility (Handelsman, 1997).

Finally, research needs to engage directly with men's accounts. Where men are included, often studies are biased towards women in their primary aim. Sometimes reports of

studies with 'couples' fail to distinguish between male and female responses, assuming that attitudes or experiences are interchangeable. The latter is also perhaps an implicit justification for data collection from one patient only — usually the woman — when issues clearly concern both parties. Researchers cannot rely on women's accounts of men's motivations, feelings and experiences. This is not to argue that women are purposively misrepresenting men, but inevitably their own experiences will shape their responses. Within heterosexual couple research, there is value in qualitative studies that explore men's and women's accounts, both independently and together. Although very rare, and presenting difficult ethical issues, such studies could be invaluable in explaining some of the relational aspects of infertility and its treatment (Morris, 2001; Seale et al., 2008).

Qualitative research with men using one-to-one, in-depth interviews could probe more deeply men's understandings and men's perspectives on the quality of care in infertility, especially in relation to procedures which are unique to them. This type of research could inform the development and testing of interventions to improve men's experience of treatment. As Boivin et al. (2012) argue, there is compelling longitudinal research to show that patients are better off and more able to reconstruct their lives if they have had a positive treatment experience and thus there is a need to consider ways in which changes in clinic practice might reduce some of the effects of infertility treatment for men in particular.

There is, however, a huge challenge in engaging men in infertility research. It is not clear at the present time whether the exclusion of men is based on the failure of researchers to consider men's involvement important or the failure of researchers to recruit adequately due to inappropriate designs and recruitment strategies and the practical difficulties of accessing men. Are men really 'hard to reach'? We need to explore ways of developing research strategies and data collection methods that are more relevant to men's needs and interests, learning from studies which have more successfully accessed men in similar fields of research (see for example Daniluk, 2001; Culley and Hudson, 2007; Hadley and Hanley, 2011; Inhorn, 2012) and exploring the impact of different instruments and different interviewers. The gender of researcher/interviewer could impact on recruitment to infertility studies, although there is little evidence on this. It would also be useful to understand the role of the clinic in recruiting men into research studies. Little is known about how clinic staff regard the presence or otherwise of men in consultations and treatment visits or whether they emphasize the relevance of research with men. Furthermore, given the intimate connections between men's and women's experiences in fertility decision making, it would be helpful to explore whether women's attitudes and behaviours play a part in the marginalization of men.

However, it may be that men are active non-responders. Do men exclude themselves due to dominant gendered perceptions of reproduction as 'women's business'? Is men's relative absence in infertility research an effect of hegemonic masculinity and if so how should researchers respond to this? Lessons drawn from the recruitment of men in earlier research on couple's reproductive decision making (Preloran et al., 2001) include focusing less on men's emotions and more on what men could contribute to 'the public world', for example the improvement of the health service of the country or the increased wellbeing of children arising from involving men in preparations for parenthood; and also from recruitment strategies that emphasized that men would retain control of the research process, including the place of the interview and the direction of the interview. Some researchers have found that a strategy of explicitly recruiting men only rather than men as part of a couple is successful because it allows the researcher to emphasize that the public world of research requires more men's voices and it is clearer that their contributions will not be ranked against those of their wives or women in general (Deeney et al., 2012). More broadly, from the field of masculinity studies, researchers emphasize the cost-effectiveness of offering men payments for participation; having male as well as female recruiters; and, as above, especially emphasizing the extrinsic value of men's participation (Adler and Adler, 2001; Butera, 2006; Oliffe and Mröz, 2005). While these are helpful suggestions, clearly, more robust enquiry is needed into why men are less likely to be included in infertility research in particular and how researchers can get more men involved. More explicit discussion in publications of successful (and less successful) practical strategies to recruit men would greatly assist this endeavour.

Conclusion

The relative absence of research on men and infertility, especially from a social perspective, is striking. Although assisted reproduction displaces 'normal' reproduction, both men and women are affected by infertility, both men and women's bodies are implicated in assisted reproduction and both men and women can be profoundly affected by infertility, its treatment and outcomes. While there is a wealth of psychological research on the consequences of infertility and treatment, and a smaller but important body of social research on several aspects of infertility, much of this marginalizes the experience of men. Moreover, it takes place within tight disciplinary boundaries which alienates research from practice. Despite some excellent work in sociology and anthropology, in reality only the psychological has a (marginal?) impact on current clinical practice. There is a need, therefore, to reframe the research agenda and begin to think seriously about how to address the 'bio-psycho-social' and how to use this approach to establish effective ways of incorporating a gender perspective into this field of health research and produce work on men (and women) whose insights can be integrated into improved clinical practice and support for all users of assisted reproduction.

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Declaration: The authors report no financial or commercial conflicts of interest.

Received 15 February 2013; refereed 29 April 2013; accepted 18 June 2013.