

Men's Preconception Health: A Primary Health-Care Viewpoint

American Journal of Men's Health
1–7
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DOI: 10.1177/1557988318776513
journals.sagepub.com/home/jmh


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Abstract

The purpose of this article is to theoretically explore men's preconception health as a mechanism to enhance fertility, as well as the health and well-being of the subject and his descendants. Premorbid risk factors and behaviors associated with stress, environmental toxins, excessive alcohol consumption, smoking, lack of exercise/obesity, and the use of illicit drugs are all known to affect fecundity. While there are many health clinics available to women, where advice in areas such as postnatal care of the newborn, family planning, and couples fertility is provided, there are few, if any, equivalent health clinics available to men.

Additionally, getting men to attend primary health-care services has also been continuously problematic, even in the context of there being a clearly discernible need for treatment. It is argued in this article that an impetus is required to encourage men to focus on and improve their preconception health and to utilize primary health-care services to take action. An assertive men's preconception health outlook can positively influence the conjugal relationship, fathering, male self-esteem, and continued good health. Using the sometimes complex concept of preconception health as a motivating factor for healthy lifestyle adaptation has the potential to improve male fertility outcomes and general health and well-being, as well as the health of future generations.

Keywords

men's health, preconception, primary health care, health-related quality of life, general health and wellness

Received January 9, 2018; revised March 15, 2018; accepted April 19, 2018

The key focus of this article is to discuss the continuing unmet need for male preconception health advocacy from a primary health-care perspective and to clarify what preconception is and how it might be implemented. To address the theoretical propositions related to preconception health care for men, a review of the evidence related to the male role in conception and how various factors are potentially involved in their preparation for fatherhood is warranted. There are few papers available about men's preconception health, with most of the published research addressing male fecundity, sperm potency, lifestyle, and the epigenetic environmental factors affecting fertility and subsequent generations (Frey, 2010; Frey, Engle, & Noble, 2012; Frey, Navarro, Kotelchuck, & Lu, 2008; Kotelchuck & Lu, 2017b; Stuppia, Franzago, Ballerini, Gatta, & Antonucci, 2015a; Warner & Frey, 2013). Frey et al. (2008) recommend that promoting preconception care for men is an opportunity to improve family planning and pregnancy results, enhance the reproductive health and health behaviors of female partners, and better prepare men to be dads.

A men's preconception primary health-care focus can additionally provide an opportunity for male disease prevention and health promotion. Nevertheless, despite these

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sound rationales, there remains little consensus in the literature on how primary health-care service delivery of preconception care for men might take shape.

In support of a preconception approach, Garfield (2018) argues that preconception health for men encapsulates a reproductive health plan, health assessment, health promotion, and clinical and psychosocial interventions to improve adolescent and young men's health. Garfield (2018) further claims that there is a need to increase epidemiological knowledge around men's preconception health and evaluation of social strategies and interventions focusing on men's health, along with policy development, financial, and legal resources to support men during their transition to parenthood.

While there is sufficient preconception scientific biological knowledge to educate fathers and develop health promotion programs for men to focus on improved health for conception (Anonymous, 2006), the key social, cultural, health, family, and specific gender issues needing to be integrated into that knowledge remain contested. The emphasis mostly is on the context of fertility, couple conception, and sexual health issues (Hammarberg, Collins, Holden, Young, & McLachlan, 2017; Warner & Frey, 2013).

Primary Health Care

Primary health care in Australia is provided by general practitioners (GPs), nurses (including general practice nurses, community nurses, and nurse practitioners), allied health professionals, midwives, pharmacists, dentists, and Aboriginal health workers. The types of services delivered under primary health care are wide-ranging and comprise health promotion, prevention and screening, early intervention, and treatment. Services can be targeted to specific population groups and may also target specific health and lifestyle conditions, for example, sexual health, drug and alcohol services, oral health, cardiovascular disease, asthma, diabetes, mental health, obesity, and cancer, but there are no services for men's preconception health care or those specifically targeted at men's health (Department of Health, Australian Government, 2010, p. 6; World Health Organization [WHO], 1978).

There also have been no male preconception primary health-care initiatives developed in Australia, nor any evaluated. Nevertheless, men's sexual health is supported by Andrology Australia, which provides information and education about the reproductive health of men, but it is not a direct primary health-care agency and the focus is on reproductive health, fertility, and sexuality (Andrology Australia, 2017). The Australian men's health policy addresses some issues related to men's sexual difficulties, but doesn't fund a primary health-care model for men's preconception health (Department of Health and Ageing, 2010; LaMontagne et al., 2016).

To clarify the importance of men's preconception health from a scientific basis, the reproductive biologist John Aitken (Aitken, Koopman, & Lewis, 2004) has stated that

The piece of the puzzle that's missing is the role of the paternal germ line in the aetiology of genetic (and possibly epigenetic) mutations in the offspring. Most spontaneous genetic mutations arise in our species via the father's (not the mother's) germ line and are powerfully influenced by age and environmental/lifestyle factors, such as smoking and obesity. (Aitken, 2017)

Mechanistically, Laurette Professor Aitken recommends that the foundation for normal offspring health involves protection of the paternal germ line from the oxidative stress that initiates DNA damage in these cells. It is suggested therefore that a primary health-care perspective could integrate and utilize the existing biological evidence regarding environmental threats to the male germ line in order to encourage men toward healthy lifestyles to improve not only their reproductive health but also their lifetime health trajectory (Aitken, 2014; Aitken, Bronson, Smith, & De Iulii, 2013; Liu & Ding, 2017).

In an attempt to frame a primary health-care response for men's preconception health, Kotelchuck and Lu (2017a) discuss a paternal approach to preconception health, one that builds an epidemiological and risk factor knowledge base. Kotelchuck and Lu (2017a) recommend addressing clinical health care, psychological resiliency/maturation, and the social determinants of health in order to nurture the development of fatherhood health policies, as well as advocacy research in a model of men's preconception health care. How this process might play out in practice, however, has not been evaluated. Disseminating and communicating the facts about reproduction and fertility and avoiding the risks associated with damage to the male germ line in a clinical context to men, though, certainly seems worthwhile.

In another proposed model, also yet to be evaluated, van der Pal-de Bruin et al. (2008) recommend a five-step process involving prospective fathers modifying their behavior based on (a) the evidence of the risk factor, (b) the modifiability of the risk, (c) the efforts necessary to eliminate or diminish the risk factor, (d) the severity of harm, and (e) the probability that harm will occur and that it will be prevented if one modifies the risk factor. At this point in time though, there is no evidence to support the efficacy of this five-step approach.

Male Sexual Health

The behavioral and lifestyle changes that men could make in order to protect and preserve a healthy germ line is not as straightforward, as it might, at first, appear. For example, in the context of men's sexual difficulties, the

Australian Ten to Men longitudinal health study reported that a range of health and lifestyle factors affect male sexual health. In turn, sexual health has an impact upon relationships, family, fathering, and long-term male health outcomes (LaMontagne et al., 2016). Schlichthorst, Sancı, and Hocking (2016) in the Ten to Men study examined health and lifestyle factors such as smoking, alcohol consumption, illicit drug use, obesity, and other factors linked to sexual difficulties (e.g., lack or loss of sexual desire, sexual aversion and lack of sexual enjoyment, erectile dysfunction, orgasmic dysfunction, and premature ejaculation for men). Schlichthorst, Sancı, and Hocking (2016) deduce that sexual difficulties are complex and, while common among men with poor physical or mental health, the premorbid status of the male must be considered, as well as other health factors, including prescribed medications.

Warner and Frey (2013) recommend that preconception sexual health and sexual function be included as part of the standard health check inventory across the patients' entire life span and that primary health-care agencies be well positioned to do this (Warner & Frey, 2013).

Primary health-care agencies in this scenario have an opportunity to explore men's preconception health and lifestyle, especially when couples present for their first pregnancy counseling, conception, or antenatal assessment, or where a male attends a GP or a fertility clinic for sexual difficulties. Sexual health is a feature of general preconception health, even when a sexual difficulty must be treated separately.

Prospective Fathers

Despite the lack of attention given to the issue of male preconception health and primary health care in the literature, there is some evidence that many men are aware of the importance of their own health prior to conception and that they would receive advice and information about preconception health care from their family physician if it were offered and if they attend for assessment (Frey et al., 2012). Frey et al. (2012), however, recommend that awareness does not always translate to knowledge of critical issues and risk factors, proposing that health practitioners may not be discussing preconception health during routine visits (Frey et al., 2012; Schlichthorst, Sancı, Pirkis, Spittal, & Hocking, 2016).

Bodin et al. (2017) propose that men can be prompted to develop a procreative consciousness and that factors related to fertility, emotional response, knowledge, and being able to visualize their future child's and partner's impact may influence their thinking prior to conception. Male preconception health care thus provides an opportunity to engage men around epidemiological factors, lifestyle, diet, exercise, and genetic predisposition to develop preconception strategies to improve male health, relationship integrity, and

family dynamics. Preconception male health takes a holistic approach to the well-being of men by not just isolating their sexual health as a difficulty, or disease state (Hammarberg et al., 2017; Schlichthorst, Sancı, Pirkis, et al., 2016; Warner & Frey, 2013).

Male role modeling, however, has arguably perpetuated a social construction of fatherhood being typified for many young men as confusing, or as undoing the errors of their own fathers (Thompson, Lee, & Adams, 2013). Poor experiences of being fathered can be introjected and then unconsciously associated to a perceived low worth of fatherhood. These poor experiences of fathering then become normative, especially in the context of the stressors associated with parenting (Miller, 2011), thereby perpetuating an ineffective cycle of fathering.

Van der Zee, De Wert, Steegers, and De Beaufort (2013) further argue that the engaged father is a father who functions as a carer and who contributes to parenting success. Unhealthy male preconception lifestyle behaviors, together with disengaged fathering, continued morbidity, and unhealthy generational outcomes, can result in children copying the behavior of their fathers, which then underwrites and perpetuates poor future conception outcomes.

Changing Behavior

To ensure men are well equipped to manage lifestyle and environmental concerns associated with preconception, it seems appropriate to invite them to participate in discussions around changing their lifestyle (if problematic) to improve conception outcomes. Unfortunately though, men are reported to ignore the lifestyle evidence, with health practitioners seemingly at a loss as to how to engage those with obvious health issues around prevention and health promotion for preconception (Fullston, McPherson, Zander-Fox, & Lane, 2017; Rizio, Thomas, O'Brien, Collins, & Holden, 2016; Schlichthorst, Sancı, Pirkis, et al., 2016; Warner & Frey, 2013). A central proposition to developing an effective male health preconception promotion program therefore needs to understand and consider how to motivate young men as potential fathers to undertake any required behavior changes.

The preconditions for motivated behavioral change are seemingly absent within these dynamics. Addressing this barrier of self-stigma toward the worth of fatherhood would appear to be needed as preceding or at least simultaneous to any primary health-care clinic-based intervention for preconception health (Corrigan, Larson, & Ruesch, 2009; Greaves, Oliffe, Ponc, Kelly, & Bottorff, 2010). Findings on the positive influence of fathers on their children's behavior, confidence, and well-being (Opondo, Redshaw, Savage-McGlynn, & Quigley, 2016) are an example of the required message to men, the general public, and health practitioners.

If one takes a futures perspective where young men could see their future selves and how lifestyle might impact on their ability to father a child or even affect their child's future development or very existence, it is conceivable that they would be motivated to adopt healthy lifestyle behaviors (Blank, Musch, & Pohl, 2007). In this context, epigenetic biological knowledge and personal intervention could make a difference. At the moment, however, epigenetic evidence, while available, is not sufficiently increasing or showing potentially the effect of lifestyle and environmental influences on the male germ line (Kotelchuck & Lu, 2017b; Stuppia, Franzago, Ballerini, Gatta, & Antonucci, 2015). As Soubry (2018, p. 8) recommends, it is expected that more data on epigenetic paternal influences will follow in the next few years, but we need to remain careful in interpreting them.

It is possible that the not so simple things like smoking cessation, alcohol moderation, and exercise can be changed, but they will require male preconception commitment (if it is considered problematic) and engagement with a practitioner to change lifestyle behaviors, at least in the beginning, at a primary health-care level (Finegersh, Rompala, Martin, & Homanics, 2015; Rance & Treloar, 2015). The evidence is clearly there and it is really, at least initially, a matter of drawing men's attention to the need to change and convincing them to improve preconception health (Aitken, 2014; Aitken et al., 2004).

If men are educated that paternal smoking and other adverse health-related behaviors, for instance, have the potential to alter the sperm DNA and directly impact on the health and well-being of the offspring (e.g., childhood cancer in the offspring of male smokers), perhaps this will provide the motivation to view fertility perspectives differently (Ji et al., 1997). Appealing to the greater good would seem to have more persuasive power, but change must first begin individually.

The research literature implies that men's preconception health is a multifaceted professional challenge. Factors related to lifestyle behaviors, domestic discord, genetic and epigenetic damage to sperm DNA, generational learned negative behaviors in male children, and paternal involvement during the antenatal period, all figure in the preconception conundrum related to men's sexual preconception health (Carlson, Kendall, & Edleson, 2015; Rotheram-Borus, Tomlinson, Roux, Stein, & Le Roux, 2015; Sadicario, Kelpin, & Svikis, 2017; St. Fleur, Damus, & Jack, 2016). Furthermore, as a man ages, the more likely it is that his ability to conceive will be affected (Aitken, 2014).

A male health focus at the primary health-care interface can address the gendered perceptions of men in society and unpack these to illustrate the need for improving health prior to conception. Such interventions will arguably challenge the scope of practice for many health professionals

who are focused on women's health and fertility, often couched as couple fertility, or as female preconception services (Hammarberg et al., 2017; Moos, 2010).

Discussion

Enhancing pregnancy outcomes through addressing primary health preconception care for men comprises two key facets: first, the provision of motivational information to prospective fathers and second, to encourage and work with them to modify behaviors based on this new knowledge (Van der Zee et al., 2013). Fatherhood identity theory suggests that men undertake a significant shift in self-identity when considering themselves to be fathers. Included in this identity shift often are enhanced levels of motivation to be a good father, a giver of care, and provider of income (Carlson et al., 2015).

Using this preconception identity shift as a motivational factor offers hope for behavioral change being undertaken by men, given some of the resistances they seemingly hold. Preliminary research conducted with a small sample of nine men advises that while some men may acknowledge the importance of male preconception care, they are only willing to modify their behaviors and lifestyle in the face of strong evidence of the benefits to pregnancy outcomes (Van der Zee et al., 2013). While a systematic review reveals inconsistent data on a range of paternal risk factors (Shah & Shah, 2010), it has been noted that not addressing male preconception care until definitive evidence is produced would be morally irresponsible (Van der Zee et al., 2013).

One can argue from an ethical perspective that men have a moral responsibility to change preconception health behaviors and lifestyle in order to create a nurturing safe environment for rearing children. Nevertheless, the evidence tells us that many men experience difficulty shifting their priorities, despite the evident desirability of being strong fathers and good relationship partners. If the male partner continues to smoke during the pregnancy, for example, there is an increased likelihood that the prospective mother will not be able to stop smoking, given the strong association between maternal and paternal smoking behavior (Alio, Salihu, Kornosky, Richman, & Marty, 2010; Gage, Everett, & Bullock, 2007; Hemsing, Greaves, O'Leary, Chan, & Okoli, 2012).

Fathers are in a powerful position to positively influence maternal behaviors, such as drug use and early utilization of antenatal care, each of which can have a significant impact on birth outcomes (Misra, Caldwell, Young, & Abelson, 2010). It is proposed that the prospective father can alter his behavior to prevent both direct and indirect harm to his future child (Van der Zee et al., 2013). Paternal involvement has also been shown to increase rates of prenatal care and reduce maternal

alcohol consumption (Misra et al., 2010), and mothers who were married, or in cohabiting relationships, have been identified to be less likely to smoke, use drugs, or have low birth-weight offspring (Teitler, 2001). Clearly, providing male preconception information and ideas about how to improve health, and subsequently fertility outcomes, has potential benefits to male health generally, especially in the context of being a physically and emotionally healthy individual, a great father, and a strong relationship partner. The important role of fathers has been further highlighted to encourage men to be actively involved in their children's lives, particularly in the antenatal period and early childhood years (Department of Health and Ageing, 2010).

Conclusion

This article has argued that a primary health-care model is an appropriate way to tackle the problems related to men's preconception health not being visible in primary health care and to address the male health outcomes in need of improvement (Frey et al., 2012; Warner & Frey, 2013). Establishing a men's primary health preconception model that incorporates consideration of sexual and overall health, fathering, future generations, child development, relationship discord, and access to services is a step forward in the right direction. A holistically healthy father, one who is engaged in the shared process of parenting, provides a strong role model for ongoing healthy male child development (Bond, Heidelbaugh, Robertson, Alio, & Parker, 2010).

Confining the construct of preconception to women misses the broader male influence, with preconception health often defined by the layperson as whether "they (the couple) can, or cannot conceive" children. In terms of conception success, nonetheless, male factors alone, or in combination with female factors, contribute to about 50% of infertility causes (Esteves, Hamada, Kondray, Pitchika, & Agarwal, 2012). Additional to this limited biomedical perspective, a focus on male preconception health, particularly in terms of preparing men at the primary health-care level for fatherhood, has the potential to reap male health benefits. Potential issues and contexts related to general health, as well as sexual health, can be discussed with men as they prepare to become fathers.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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