Fertility-awareness knowledge, attitudes and practices of women attending general practice

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Background

Most women who attend assisted reproductive technology (ART) clinics believe women should receive fertility-awareness education when they first report trouble conceiving. Interest in fertility awareness among women who attend general practice is largely unknown. We aimed to measure fertility-awareness knowledge, attitudes and practices of women attending general practice.

Methods

A cross-sectional survey of women attending three different general practices was conducted.

Results

Of the respondents, 37.1% actively tried to improve their knowledge of fertility awareness, 9.8% were actively planning a pregnancy and 4.3% were using fertility awareness as contraception. Yet, only 2.1% of the overall sample correctly identified the fertile period of the menstrual cycle. Most respondents (92.2%) believed women should receive fertility-awareness education when they first report trouble conceiving.

Discussion

One-third of women who attend general practice show interest in fertility awareness, but far fewer can correctly identify the fertile period of the menstrual cycle. All women who report using fertility awareness as contraception should be counselled on their actual knowledge and advised accordingly. Concordant with our previous study of women who experience infertility, most women who attend general practice believe that women should receive fertility-awareness education when they first report trouble conceiving. Further research is needed to determine how best to do this.

One in six Australian couples has trouble conceiving,[1] and one in 35 babies is born from assisted reproductive technology (ART).[2] However, ART is highly invasive, expensive, and associated with increased morbidity and mortality for mothers and babies.[3] The incidence of unplanned pregnancy also remains problematic, with an estimated one in two pregnancies being unwanted or mistimed.[4,5] Most unplanned pregnancies occur as a result of non-use or imperfect use of contraception,[5,6] and misconceptions regarding the fertile period of the menstrual cycle.[5,7]

Fertility awareness is generally defined as a woman's ability to identify the fertile period of the menstrual cycle.[8] There are three methods of fertility awareness: rhythm, temperature and mucus.[8] Rhythm is accurate for <30% of women.[9] However, the more modern methods, temperature and mucus, are highly accurate.[10]

Table 1. Methods for grading fertility-awareness categories

Fertility-awareness categories	Methods
None	Answered: 'Never' aware of the fertile days of the menstrual cycle
Poor	Awareness of the fertile days was based on a rhythm/calendar approach, perceived ovulation pain or poor knowledge of the mucus method
Moderate	Gave correct answers to questions about the mucus method but had not documented a minimum of three menstrual cycles with this method
High	Gave correct answers to questions about the mucus or temperature method and had documented three or more menstrual cycles with either method

Temperature retrospectively indicates the fertile period of the menstrual cycle by a rise in basal body temperature of 0.2–0.5°C that remains elevated until next menstruation.[10] Mucus prospectively indicates the entire fertile period by the presence of fertile-type mucus at the vulva.[10] The more modern methods can assist accurately timed intercourse to help some couples who experience infertility avoid unnecessary ART treatment.[11,12] Conversely, when correctly applied as contraception, these have a failure rate of 3% or less.[8]

Despite the high prevalence of infertility[1] and unplanned pregnancy,[4] and the associated consequences for mothers and babies,[6,13] remarkably little research has explored the possible link between women's understanding of the fertile period of the menstrual cycle and their agency to achieve and avoid pregnancy. We aimed to measure fertility-awareness knowledge, attitudes and practices of women attending general practice.

Methods

The sample

We undertook a cross-sectional survey of women attending three general practices, selected according to the 'Index of relative socioeconomic disadvantage',[14] in order to obtain the views of women of high and low socioeconomic status (SES), and rural backgrounds. Decile scores from 1 to 10 reflect a continuum of socioeconomic advantage and disadvantage for areas, and were found to be 10, 1 and 4 respectively for the targeted practices.[14]

All women consecutively presenting, aged 18–44 years, were invited by the receptionists at their general practice to complete the questionnaire onsite or at home, and in the latter instance return it in a reply-paid envelope. Women were excluded if they could not read English. The survey was conducted between December 2008 and July 2009.

From the percentage of women experiencing infertility with high fertility awareness in our previous study (12.7%),[15] it was determined that a minimum sample

Table 2. Socioeconomic characteristics, fertility awareness, contraceptive use and pregnancy intention

	No. (%)
Location of the general practice	
Outer metropolitan	102 (31.4)
Inner metropolitan	123 (37.5)
Rural	102 (31.1)
Age group	
25 years or younger	67 (20.4)
26–35 years	162 (49.4)
36 years or older	99 (30.2)
Highest level of education attained	
Completed primary school	11 (3.4)
Completed secondary school	98 (30.2)
Completed a TAFE course	37 (11.4)
Completed a university degree	179 (55.1)
Average menstrual cycle	
Irregular (36 days or longer)	40 (11.8)
Short (26 days or less)	53 (16.4)
Regular (27–35 days)	190 (58.8)
Pregnancy intention	
I have no plans to have children	15 (4.6)
I have completed my family	109 (33.3)
I plan to have children in the future	125 (38.2)
I am currently planning a pregnancy	32 (9.8)
I am currently pregnant	46 (14.1)
Currently using contraception	
Yes	184 (56.3)
No	143 (43.7)
Contraceptive methods used†	
Tubal ligation and vasectomy	9 (4.8)
Oral contraceptive pill	93 (50.5)
Male condom	49 (26.6)
Natural birth control only (rhythm/calendar, mucus or temperature methods) or in combination with condoms or 'withdrawal'	8 (4.3)
Implanon	5 (2.7)
Depro-provera	2 (1.0)
'Withdrawal'	6 (3.2)
Tubaligation or vasectomy	9 (4.8)
Intrauterine device	13 (7.0)
Fertility-awareness categories	
None	125 (38.1)
Poor	157 (47.9)
Moderate	39 (11.9)
High	7 (2.1)

size of 233 was required to obtain a 95% confidence level that <30% of women attending general practice could identify the fertile window of the menstrual cycle.

Ethics approval was obtained from the Monash University Human Research Ethics Committee (reference number CF08/2008 – 2008000979).

Instrument

The questionnaire was adapted from our previous study of women who experience infertility,[15] then piloted by 30 women in a rural general practice, resulting in some grammatical amendments.

The 14-item questionnaire was divided into three parts. Part one gathered the socio-demographic characteristics of the sample, including age group, highest educational level attained, use of contraceptive and family planning intention. Part two measured the women's knowledge and practice of the rhythm, temperature and mucus methods, with detailed questions on each method. Part three measured attitudes to fertility awareness by gathering information about any attempts to improve their knowledge. Two 5-point Likert scale statements (from strongly agree to strongly disagree) measured perceived importance of fertility-awareness education when women first report trouble conceiving. The questionnaire was tested for reliability using the Kappa measure of agreement, with a resultant Kappa value of 0.925, representing very good agreement.[16]

Analysis

Using a 'Fertility-awareness assessment sheet' informed by research evidence in the field,[8,9,17,18] two experienced women's health practitioners independently graded each completed questionnaire into one of four fertility-awareness categories (none, poor, moderate and high; Table 1). All differences (4.6%) in assigning the categories were resolved though discussion. Only respondents who gave correct answers to questions about the mucus or temperature method, and had documented a minimum of three menstrual cycles with either method, were graded as having high fertility awareness. The data were analysed using SPSS Statistics (version 17.0),[19] and logistic regression analysis was conducted to determine the factors (socio-demographic characteristics, contraceptive method, pregnancy intention and sources of fertility-awareness information) associated with higher levels of fertility-awareness knowledge. A factor with a *P*-value <0.05 was considered statistically significant.

Table 2. Socioeconomic characteristics, fertility awareness, contraceptive use and pregnancy intention

	No. (%)
Perceived awareness of the fertile days	
Never aware	116 (36.1)
Sometime aware	113 (35.2)
Often aware	92 (28.7)
Attitudes to fertility awareness	
'Timing sexual intercourse within the fertile time of the menstrual cycle can help some infertile couples to conceive'	
Strongly agreed or agreed	240 (76.7)
Undecided	51 (16.3)
Disagreed or strongly disagreed	21 (6.7)
'A woman should receive fertility-awareness education to increase her awareness of the fertile time in the menstrual cycle when she first reports trouble conceiving to her doctor'	
Strongly agreed or agreed	293 (92.2)
Undecided	14 (4.4)
Disagreed or strongly disagreed	11 (3.4)
Actively tried to improve knowledge of fertility awareness	
Yes*	93 (37.1)
No	158 (62.9)
Types of fertility-awareness information sources women accessed‡	
Other	1 (0.01)
Books	63 (67.7)
Internet	37 (39.8)
General practitioner	28 (30.1)
Friends	22 (23.7)
In vitro fertilisation (IVF) clinic	18 (19.4)
Trained teacher in fertility-awareness methods	7 (7.5)
Number of different types of fertility-awareness information sources individual women accessed	
1	31 (33.3)
2	27 (29.0)
3	11 (11.8)
4 or more	5 (5.3)

Total sample size, n = 328
Note, responses in some categories do not add up to 100% as there are missing data
**Respondents answered 'Yes' to the previous question*
†Contraceptives, including spermicide, female condom, diaphragm, NuvaRing and contraceptive sponge are not included in this list as no woman reported their use
‡More than one source of fertility-awareness information could be ticked, therefore numbers do not add up to the total number (n = 93) of those who actively tried to improve their knowledge

Results

Of 510 distributed questionnaires, 328 were returned (response rate = 64.3%). The returned questionnaires fairly evenly represented the three practices (Table 2).

Socio-demographic characteristics, pregnancy intention and use of contraceptive

Of the respondents, around half were aged 26–35 years (49.4%), had completed a university degree (55.1%) and reported having a regular, monthly menstrual cycle (58.8%). In addition, 9.8% were actively planning a pregnancy and 56.3% were using contraception. Of those who were using contraception, 4.3% were using fertility awareness only or fertility awareness in combination with condoms or 'withdrawal'.

Attitudes to fertility awareness

Around one-third (37.1%) of respondents actively tried to improve their understanding of fertility awareness from one or more sources of information (namely the internet, books and general practitioners [GPs]). Most agreed or strongly agreed that accurately timed intercourse may help some couples who experience infertility to conceive (76.7%), and that women should receive fertility-awareness education when they first report trouble conceiving (92.2%).

Fertility-awareness knowledge and practice

Although more than half (63.9%) of the respondents believed they were often aware (28.7%) or sometimes aware (35.2%) of the 'fertile period', only 2.1% were graded as having high fertility awareness. Most respondents had no (38.1%) or poor (47.9%) knowledge of fertility awareness.

Factors associated with higher levels of fertility-awareness knowledge

Table 3 presents the results of the regression analysis. Higher levels of fertility-awareness knowledge were associated with (a) being pregnant, (b) having completed their family or (c) being >36 years. Fertility awareness information was obtained from books and teachers trained in fertility-awareness methods. No association was found between higher levels of fertility-awareness knowledge and women who were using fertility awareness as contraception, compared with other contraceptive methods, SES (ie location of

Table 3. Factors associated with higher levels of knowledge of fertility awareness

	Adjusted odds ratio (95% confidence intervals)
Location of the general practice	
Outer metropolitan	1.00 (reference)
Inner metropolitan	1.09 (0.58, 2.05)
Rural	0.64 (0.33, 1.23)
Age group	
25 years or younger	1.00 (reference)
26–35 years	1.38 (0.73, 2.60)
36 years or older	3.41 (1.44, 8.05)*
Highest level of education attained	
Completed primary school	1.00 (reference)
Completed secondary school	0.62 (0.19, 1.98)
Completed a TAFE course	0.87 (0.24, 3.10)
Completed a university degree	0.90 (0.28, 2.83)
Average menstrual cycle	
Irregular (36 days or longer)	1.00 (reference)
Short (26 days or less)	1.67 (0.79, 3.50)
Regular (27–35 days)	1.53 (0.87, 2.70)
Pregnancy intention	
I have no plans to have children	1.00 (reference)
I have completed my family	3.83 (1.18, 12.42)*
I plan to have children in the future	3.85 (1.19, 12.35)*
I am currently planning a pregnancy	2.770 (0.74, 10.34)
I am currently pregnant	3.82 (1.08, 13.46)*
Contraceptive methods used	
Tubal ligation and vasectomy	1.00 (reference)
Oral contraceptive pill	1.37 (0.81, 2.31)
Male condom	1.18 (0.61, 2.29)
Natural birth control only (rhythm/calendar, mucus or temperature methods) or in combination with condoms or 'withdrawal'	0.86 (0.21, 3.45)
Fertility-awareness information sources women accessed	
Other	1.00 (reference)
Books	2.26 (1.11, 4.59)*
Internet	2.21 (0.98, 4.99)
General practitioner	1.65 (0.66, 4.11)
Friends	1.65 (0.63, 4.33)
IVF clinic	1.43 (0.49, 4.11)
Trained teacher in fertility-awareness methods	5.75 (1.20, 7.49)*

Total sample size, n = 328
**Adjusted odds ratios (OR) with associated 95% confidence intervals (CIs) for factors associated with higher levels of knowledge of fertility awareness estimated from logistic regression; P <0.05*

the targeted practices), university education or having a regular, monthly menstrual cycle.

Discussion

This is the first study to measure fertility-awareness knowledge, attitudes and practices of women attending general practice. When comparing the results of this study with our previously published study on women who experience infertility,[15] several similarities were found. On admission to ART clinics, typically after failing to conceive for 12 months or longer, our previous study found fertility awareness in women attending general practice only increased slightly to 12.7%,[15] up from 2.1%. This is despite the fact that interest in fertility awareness rises sharply in women who experience infertility; 86.8%,[15] compared with 37.1%, of women who attend general practice actively try to improve their knowledge of fertility awareness from one or more sources of information. Similarly, we found that the great majority of women in both studies (92.2% and 94.5% respectively) believe women should receive fertility-awareness education when they first report trouble conceiving.

Our studies highlight an important gap in the general education and primary care of women who experience infertility.[15,20] The importance of ensuring correctly timed intercourse in primary care is underscored by the fact that when a couple arrives at an ART clinic, they may not want to go back to 'basics' and the opportunity of conceiving naturally will have been lost.[21] There is good evidence that fertility awareness in women who are sub-fertile (eg delayed child bearing) may help some couples who experience infertility to conceive.[11,22,23] In addition, we found that none of the women who were using fertility awareness as contraception (4.3%) were graded as having high fertility awareness, putting them at risk of an unplanned pregnancy.[8]

Fertility awareness was not influenced by SES, university education,[15,17] regular menses or choice of contraceptive method. Instead, we found that fertility awareness increases with women's interest in this,[15] having children and being towards the end of childbearing (>36 years of age).

Books and the internet were the most frequent sources of fertility-awareness information.[15] While women who used books as a source of information were associated with high fertility awareness, most women who used books and the internet failed to attain a grading of high fertility awareness.[15] We also found that a large gap exists between what women wanted to know about fertility awareness and what they actually know,[15] and that many women significantly overestimate the limited knowledge they have.[15,17] These discrepancies warrant further investigation with the view to targeting identified barriers to women attaining high fertility awareness.

Only 30.1% of respondents in our study sought and obtained fertility-awareness information from their GP. Therefore, GPs may be unaware of women's limited fertility knowledge[15,20,24] and their desire for greater educational support in primary care to conceive.[15] Only trained teachers in fertility awareness are consistently associated with high fertility awareness.[18,24,25] Better education of primary care practitioners in fertility-awareness methods and better delivery of fertility-awareness education in general practice would optimally support women to attain this important reproductive knowledge and assist them to achieve their reproductive life plan.

Limitations and strengths

The small sample size that was recruited from only three general practices and the possibility of response bias reduces the generalisability of our findings. Despite these limitations, the study provides comparative and confirmative data to our previous study of infertile women,[15] and highlights an avoidable risk factor for unplanned pregnancy that should be addressed in general practice.

Implications for general practice

All women who report using fertility awareness as contraception should be counselled on their actual knowledge and advised accordingly. Concordant with our study of women who experience infertility, most women attending general practice believe that women should receive fertility-awareness education when they first report trouble conceiving. Further research is needed to determine how best to do this.

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