

Infertility evaluation and treatment among women in the United States

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Objective: To examine the characteristics of women seeking infertility evaluation and treatment.

Design: Cross-sectional survey based on in-person interviews, followed by two-step hurdle analysis.

Setting: Not applicable.

Patient(s): 4,558 married or cohabitating women ages 25 to 44 years.

Intervention(s): None.

Main Outcome Measure(s): Likelihood of seeking a preliminary infertility evaluation and of seeking infertility treatment once evaluated, and the treatment type provided.

Result(s): Of 623 women (13.7%) who reported seeking an infertility evaluation, 328 reported undergoing subsequent infertility treatment. Age at marriage, marital status, education, health insurance status, race/ethnicity, and religion were associated with the likelihood of seeking infertility evaluation. For example, the predicted probability that a non-white woman who married at age 25 will seek evaluation was 12%. This probability increased to 34% for white women with a graduate degree who had married at age 30. Among women who were evaluated, income, employment status, and ethnicity correlated strongly with the likelihood of seeking infertility treatment. Infertility drug therapy was the most frequent treatment used, and reproductive surgery and in vitro fertilization (IVF) were used the least often.

Conclusion(s): The use of infertility services is not random. Understanding the sociodemographic factors correlated with use may assist new couples with family planning. Roughly 50% of the women evaluated for infertility progressed to treatment, and only a small proportion were treated with more advanced assisted reproductive technologies such as in vitro fertilization. Future research aimed at improving access to effective health-care treatments within the boundaries of affordability is warranted. (Fertil Steril® 2013;100:1025–32. ©2013 by American Society for Reproductive Medicine.)

Key Words: Assisted reproduction, family planning, infertility, infertility evaluation, infertility treatment

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Infertility is defined by the National Survey of Family Growth (NSFG) as the failure to conceive after at least 12 consecutive months of unprotected sexual intercourse (1–3). Infertility continues to be a major

public health concern in the United States, as illustrated by the sizeable number of women seeking preliminary infertility evaluations and infertility treatments (2, 4, 5). Today, approximately 12% of women 15 to

44 years of age have reported ever having received any infertility services (evaluation and/or treatment), indicating that 7.4 million women and their partners are affected by fertility-related issues in the United States (1, 6).

Overall infertility rates may be attributed to trends in delaying pregnancy—an increasingly common choice for couples. Increased reproductive age is a significant factor in reduced fertility. For women, fertility peaks in the early to mid-20s, declines slightly in the early 30s, and then declines significantly in the middle to late 30s (7). For men,

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sterility is reported to increase substantially in the late 30s and continues to accelerate after age 40 (8). A couple's infertility may also be attributable to an array of biologic issues, including conditions in women such as tubal factors, ovulatory dysfunction, diminished ovarian reserve, endometriosis, and uterine factors, and/or male factors such as abnormal ejaculation or semen, or varicocele (9, 10). However, with recent advances in infertility treatments, these biologic factors are not as limiting as increased reproductive age (11). For many couples, the decision to pursue professional development and thereby delay pregnancy may impose the greatest risk for involuntary childlessness.

Recent studies have suggested racial disparities in the use of infertility services and their outcomes. Chandra and Stephen (3) and Terava et al. (12) report that infertility service use is higher among white women and among all women with higher incomes and education. Furthermore, Wellons et al. (13) found evidence indicating that the rates of live birth after an in vitro fertilization (IVF) treatment were highest among white women and lowest among black women. It is difficult, however, to separate the racial disparities in the use of infertility services from other potential variables such as differences in community perceptions, culture, family values, accessible information, access to care (14), and issues of cost and affordability (3, 15–17). In the United States, the average cost for one IVF cycle is \$12,400 (18), though the out-of-pocket costs can vary widely depending on third-party insurance coverage. Consequently, financial factors have received the most attention in explaining the inequalities in infertility service use (17, 19, 20).

Although evidence indicates the existence of racial, ethnic, and socioeconomic disparities in the use of infertility services, it is unclear whether these disparities exist across the entire range of services available. For instance, some physicians may provide a preliminary evaluation, using options (e.g., semen analysis, anatomy assessment, ovarian reserve, or follicle stimulating hormone counts) that are noninvasive, relatively inexpensive, and may be covered by insurance. In contrast, others may undergo actual procedures, such as surgery, artificial insemination, or IVF, that are more expensive and often not covered by insurance. In this study, we estimate the likelihood of seeking a preliminary infertility evaluation and the subsequent likelihood of undergoing infertility treatments based on various respondent characteristics.

MATERIALS AND METHODS

Because the study involved the use of a secondary data set that is publicly available and stripped of all identifiers, formal approval from the institutional review board was not required. The NSFG is a cross-sectional, multicycle survey conducted by the University of Michigan's Institute for Social Research (21). It was originally designed to be the national fertility survey of the United States, and it collects information from a national sample of men and women. Surveys of women were conducted during all seven cycles (1973, 1976, 1982, 1988, 1995, 2002, and 2006–2010), and the surveys of men were conducted only during the two most recent cycles (2002 and 2006–2010).

The 2006–2010 survey was based on 22,682 face-to-face interviews, consisting of 10,403 male and 12,279 female respondents, ages 15 to 44 years. The sample is nationally representative, including an oversampling of black, Hispanic, and teenage respondents, which was incorporated into the analysis through the use of sampling weights provided by the NSFG. In-person interviews were administered in both English and Spanish and covered a wide range of topics including health, marriage, and family planning (22). For this analysis, and because infertility is generally experienced by a couple rather than an individual (16), we restricted our sample to female respondents aged 25 to 44 years who were currently married or in a cohabitating relationship. Among the 12,279 female respondents, 4,558 women met these two criteria.

During the interviews, female respondents were asked whether they or their husband/partner had ever received medical assistance to become pregnant. Respondents who answered affirmatively were shown a card listing various infertility services (i.e., advice from a physician, testing, drugs to improve ovulation, surgery to correct blocked tubes, artificial insemination, other types of medical help) and were asked, "Which of the services shown...have you or your husband/partner/previous partner had to help you become pregnant?" If respondents reported the use of "other types of medical help," the interviewer then presented a second card listing various treatments (i.e., surgery or drug treatment for endometriosis, IVF, surgery or drug treatment for uterine fibroids, some other female pelvic surgery, or other medical help) and were asked, "Which of these other types of medical help did either of you receive for becoming pregnant?"

In a separate set of questions, female respondents were asked whether they had ever received medical help to prevent a miscarriage. The NSFG categorizes "medical help to prevent miscarriage" as an additional infertility service, but we do not include these women in our analysis because our focus is only on services that assist women in becoming pregnant. Medical services to help prevent a miscarriage may represent a different set of clinical conditions unrelated to difficulties conceiving.

In separate interviews, a national sample of male respondents (unrelated to the female respondents) was asked whether they or their wife/partner had ever undergone infertility treatments. Only one respondent reported his own use of a treatment; others reported their partner's use of treatments, such as surgery to correct fallopian tubes, artificial insemination, IVF, and drugs to improve ovulation. Therefore, this analysis focused on infertility service use as reported by women only, although the underlying cause could be male factors, female factors, or a combination of the two.

The NSFG survey also included questions regarding respondent demographics, socioeconomic status (SES), current living arrangements, and religion (Table 1), which were included as variables that may influence whether a woman wants to have a child and whether she has ever sought medical help to have a child. Respondents also were asked their date of birth, date of marriage (if applicable), and the date they began living with their current husband or partner. For this analysis, age at marriage was divided into two categories using the mean age at marriage (26 years) as the threshold, and length of the current relationship was calculated using

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