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Predictors of not pursuing infertility treatment after an infertility diagnosis: examination of a prospective U.S. cohort

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Abstract

We studied a prospective cohort of 434 couples in Northern California and found that 13% did not pursue any form of infertility treatment after their initial consultation. While age, education, and financial concerns remain important for patients in choosing whether to pursue infertility treatment, depressive symptoms may also be a barrier to achieving reproductive goals.

Data from the most recent U.S. National Survey of Family Growth (NSFG) suggests that approximately 7 million women and 4 million men suffer from impaired fecundity (1,2). While more patients seek medical advice for infertility than ultimately pursue medical treatment, our understanding of why some couples in the United States do not proceed with further treatment is incomplete. Recent NSFG data suggests that sociodemographic factors are important in infertility treatment pursuit (3). These may include financial, interpersonal, psychological, and marital factors - even in countries where infertility services are subsidized (4–8). For example, in Scotland, psychological stress was a major reason for infertility treatment discontinuation (6). In addition, research from Sweden and the Netherlands found that between half and two-thirds of infertility patients chose not to proceed with the full extent of treatment services subsidized by their governments (10,12). In these studies, the psychological burden and sense of futility associated with treatment were cited as the primary reasons for discontinuation (7, 8).

While Smeenk et al have reported that pretreatment psychological testing alone can predict which patients chose to discontinue treatment (8), age, intensity of infertility treatment, infertility diagnosis, and financial concerns have all been linked to treatment pursuit (5,6,9).

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The goals of the present study are to document the rate at which patients in a cohort of infertility patients in the United States declined to pursue treatment and to determine the reasons for this decision.

Couples were recruited into the study cohort from eight participating reproductive endocrinology and infertility (REI) clinics in the Bay Area. The initial inclusion criteria for the study were that the female partner presented for an initial infertility appointment and was currently trying to get pregnant with a male partner. Study participants completed questionnaires at the time of enrollment that contained medical and infertility histories and socioeconomic and demographic data. Study participants were then interviewed at 4 months, 10 months, and 18 months from entry to assess treatment and progress. Interviews were semi-structured, lasted approximately one hour, and covered topics related to infertility treatments as well emotional, financial, and social factors regarding infertility pursuit. Follow-up interviews were conducted by telephone. All procedures were approved by the Institutional Review Board of the University of California, San Francisco, and all participants provided written consent.

Of 2,291 potential subjects identified, 1,061 (46.3%) were determined to be eligible. Of the eligible subjects, 372 (35.1%) refused, we were unable to contact 194 (18.3%), and 58 (5.5%) undertook a fertility treatment procedure before we could conduct their baseline interview. 437 women were interviewed (41.2% of those eligible) of whom 434 had adequate data for analysis. Overall, 96% completed the first follow-up interview at 4 months, 93% completed the second follow-up interview at 10 months, and 89% completed the third follow-up interview at 18 months.

Patients were characterized as undergoing treatment if they received cycle-based (ovarian stimulation, IUI, or IVF), medical, or surgical treatment to optimize reproductive success (e.g., insulin-sensitizing medication, myomectomy for uterine fibroids, surgical treatment for endometriosis, etc) or were undergoing infertility testing. Participants who did not undergo infertility testing or treatment after their initial evaluation were characterized as having not pursued treatment.

The potentially confounding effects of male and female age, educational level, annual household income, insurance coverage (any health insurance, type of insurance, coverage for infertility services), religious affiliation, race, marriage, duration of infertility, previous offspring, perceived infertility diagnosis, depression, and anxiety were examined for association with no treatment. In addition, couples were asked if they knew anyone who had tried, gotten pregnant, or had a child with IVF. Medical record abstraction was used to determine infertility diagnosis (female factor – ovarian, ovulatory, tubal, uterine; male factor; both; unknown).

Depressive symptoms were assessed with the 20-item Center for Epidemiologic Studies Depression scale (CESD) administered in the baseline questionnaire. The CESD was developed for use as a screening instrument to identify persons at risk for clinical depression (10). CESD scores range from 0 – 60. A score of 16 on the CESD has been shown to correlate with clinical depression (11). Anxiety was assessed using the State Anxiety subscale of the State-Trait Anxiety Inventory (STAI), a 20-item measure of feelings of tension, anxiety, and apprehension (12).

As our goal was a descriptive model of couples who did not attempt cycle-based treatment after initial REI consultation, our inclusion criteria for the multivariate logistic regression model were broad. Covariates in the final model were prescreened by bivariable analysis to examine the relationship between each covariate and no treatment (i.e. the outcome). Only covariates that were associated with the pursuit of treatment at p value ≤ 0.2 in bivariable

analysis were included in the final model. We report Odds Ratios (ORs) and their 95% confidence intervals to estimate the association between no treatment and other variables for multivariable evaluation.

The study inclusion criteria were met by 434 couples with a mean female partner age of 35.7 ± 4.8 years and male partner age of 36.9 ± 5.5 years. Eighty-seven percent of the couples in the cohort were married. The average duration of infertility was 2.1 ± 1.7 years, and 24% of couples had a previous child. Seventy-six percent of the cohort had a college education and 67% earned at least \$100,000 annually. Of 434 patients enrolled, 55 (13%) did not undergo any treatment.

When interviewed about why they had chosen to not pursue infertility treatment, 58% described financial concerns, 38% listed personal life circumstances (i.e. moving, death in family, return to school), 26% mentioned medical futility, and 20% stated emotional stress as reasons for not pursuing infertility treatment.

On multivariable analysis, for each 5-year increase in a women's age at initial reproductive endocrinology evaluation, the odds of not pursuing treatment increased by 77% (95% CI 11% – 182%). Likewise for every 4.5 point ($\frac{1}{2}$ standard deviation) increase in CESD score, the odds of not pursuing treatment increased by 23% (95% CI 1%–51%). In contrast, women who had a less than a college education had a 79% (95% CI 55%–90%) higher odds of not pursuing treatment compared than to women with a college education. There was a trend toward a lower income raising the odds of not pursuing treatment which did not reach statistical significance ($p=0.08$; Table 1).

In our cohort of 434 infertile couples in the Western United States, 13% did not pursue any infertility treatment after having had an infertility consultation with a reproductive endocrinologist. We found that age, socioeconomic status, and psychological factors were significant as patients who did not pursue treatment were older, less educated, less wealthy, and had higher baseline CESD (depression) scores when compared to the remainder of the cohort.

Education independently predicted overall utilization of infertility care in the cohort and there was a trend toward income predicting patients who ultimately pursued cycle-based treatment. With cycle-based treatment's relatively high costs, it is perhaps not surprising that couples with financial means are more able to pursue such treatment. While a higher education does correlate with financial means, it may also be associated with greater utilization of literature and resources that establish the efficacy of infertility treatment. While education and income may also be related to a social network with access and experience with advanced reproductive technologies, we did not find an association between knowing others with successful IVF outcomes and desire to pursue treatment.

Not only was emotional stress commonly cited as a reason for not proceeding with treatment, but we also found that patients with higher depression scores were more likely not to pursue infertility treatment than those with lower scores. That emotional stress plays a significant role in treatment decision-making is illustrated by observations that even in countries with subsidized IVF cycles, psychological stress remains the most common reason for treatment discontinuation (4,8,13). As anxiety and depression have even been linked to IVF treatment outcomes, it has been suggested that counseling of patients at the initiation of the infertility evaluation may improve overall treatment efficacy (4,8,13,14).

We acknowledge certain limitations of our study. As our recruitment was based on subject willingness to participate, unmeasured biases may have accounted for some patients' refusal to join. In addition, an unknown number of infertile couples may have elected not to pursue treatment prior to an evaluation by a reproductive endocrinologist and would thus not be

captured by our recruitment process. While questionnaires and interviews were used to capture the complexities of couples' infertility decision making, unmeasured variables such as past and present life experiences could also have played a role. Finally, our gauge of depression was a psychometric measure of depressive symptoms and not a clinical evaluation.

In conclusion, while financial concerns remain important for patients in choosing reproductive options, age, education, and psychological factors are also important. Severity of depressive symptoms appears to be a barrier to achieving reproductive goals, which argues for the institution of methods aimed at detection and treatment of depression at the initial infertility evaluation.

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Table 1

Multivariable logistic regression model assessing associations between baseline demographic, socioeconomic, and psychological factors and not pursuing infertility treatment or evaluation. Odds ratios, 95% confidence intervals, and p values listed. All coefficients reflect adjustments for all variables listed in table.

Variable		OR (95% CI)	p value
Age	5 year increase	1.77 (1.11, 2.82)	0.02
Education	≤ Some College vs.		
	≥ College Degree	0.21 (0.10, 0.45)	0.00
	≤ \$100K	reference	
Income	\$100,001–200,000	0.78 (0.36, 1.67)	0.08*
	≥ \$200K	0.16 (0.02, 1.25)	
Race	White vs. Other	0.83 (0.38, 1.81)	0.64
CESD	0.5 SD increase	1.23 (1.01, 1.51)	0.04
Ovarian			
Dysfunction	Any vs. None	0.62 (0.24, 1.62)	0.33
Ovulatory			
Dysfunction	Any vs. None	0.52 (0.20, 1.38)	0.27

*
p value of test for linear trend