

# CLINICAL AND SOCIOECONOMIC FACTORS ASSOCIATED WITH DISCONTINUATION OF AUTOLOGOUS IN VITRO FERTILIZATION CYCLES IN A RACIALLY DIVERSE, AND UNDERSERVED POPULATION

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## BACKGROUND

- Access to infertility care in the U.S. remains unequal due to high treatment costs and limited insurance coverage (1)
- Racial disparities in IVF utilization and outcomes persist, even in states with mandated insurance coverage (2)
- Treatment discontinuation is influenced by more than cost alone and may reflect differences in insurance, clinical prognosis, and socioeconomic context (3)
- Understanding how these intersecting factors shape IVF continuity is essential to improving equity in fertility care.

## OBJECTIVES

- To examine the interaction between race, clinical, and socioeconomic factors in IVF treatment discontinuation.
- To assess whether insurance coverage modifies these associations.

## METHODS

### Study Design

- Single academic center retrospective cohort study (2016 – 2021)

### Participants

- Non-Hispanic Black (NHB) and non-Hispanic White (NHW) women aged 18 – 44 who initiated autologous IVF/ICSI cycles
- Up to three cycles per participants

### Exclusions

- Egg donor cycles, gestational carrier cycles, prior IVF cycles

### Data Sources

- Demographic, clinical, and insurance data extracted from EPIC
- Neighborhood socioeconomic variables obtained from U.S. Census data using ZIP code

### Statistical Analysis

- Baseline characteristics were summarized using descriptive statistics
- Continuous variables were reported as mean ± SD and categorical variables as n (%)
- Group comparisons were performed using student's t-test and Chi-squared test, as appropriate
- A neighborhood-level socioeconomic (SES) index was constructed using ZIP code-derived census variables. Each component was categorized into cohort-specific tertiles (33rd and 67th percentile cut points), scored 0 – 2, and summed to generate a SES composite score (range 0 – 12) with higher scores reflecting greater disadvantage
- The SES composite score is further dichotomized into lower (0 – 6) and higher (7-12) disadvantage
- Multivariable stepwise logistic regression models were used to evaluate associations with treatment discontinuation and delayed return to care
- Effect estimates were reported as odds ratios (ORs) with 95% confidence intervals (CI)
- p < 0.05 was considered statistically significant
- All analyses were performed using the Clinical Research Tool (Version 1.2.0; OpenSimplify)

### Outcomes

- **Primary:** IVF treatment discontinuation (>365 days without return)
- **Secondary:** Delayed return to care (>6 months or no return)

## RESULTS

**Table 1.** Comparison of demographic and clinical characteristics between Non-Hispanic White and Non-Hispanic Black women\*

Variables	Categories	Non-Hispanic Black (N = 125)	Non-Hispanic White (N = 123)	P-Value
Relationship Status	Married	81 (64.8)	102 (82.9)	0.002
	Single	44 (35.2)	21 (17.1)	
Age at IVF start (years)		37.50 (4.46)	36.03 (4.55)	0.011
Gravidity	≥ 1	86 (68.8)	60 (48.8)	0.002
	0	39 (31.2)	63 (51.2)	
Parity	≥ 1	40 (32.0)	23 (18.7)	0.024
	0	85 (68.0)	100 (81.3)	
BMI (kg/m <sup>2</sup> )		30.63 (6.08)	27.22 (6.61)	<0.001
Structural Factor	No	44 (35.2)	98 (79.7)	<0.001
	Yes	81 (64.8)	25 (20.3)	
Unexplained / Other Factor	No	72 (57.6)	54 (43.9)	0.042
	Yes	53 (42.4)	69 (56.1)	
Antral Follicle Count (AFC)	≤ 9	50 (40.3)	29 (23.6)	0.016
	10 - 19	42 (33.9)	57 (46.3)	
	≥ 20	32 (25.8)	37 (30.1)	
Geographic Distance Between Residence and ART Clinic (miles)		45.49 (170.23)	99.59 (397.49)	0.164
Median Household Income (USD)	≤ \$68,343	62 (49.6)	20 (16.3)	<0.001
	\$68,344 - \$112,799	46 (36.8)	38 (30.9)	
	≥ \$112,800	17 (13.6)	65 (52.8)	
Education Level (% population with college degree)		32.06 (14.58)	50.87 (19.34)	<0.001
Percent of City Population Below Poverty Line		16.40 (9.65)	8.91 (6.09)	<0.001
City Unemployment Rate (% statewide)		43.00 (5.87)	40.10 (6.26)	<0.001
Percent of city household speaking non-English primary language		40.38 (17.48)	32.58 (15.41)	<0.001
SES Composite Score		7.29 (2.93)	4.64 (3.11)	<0.001
SES index	Higher disadvantage	78 (62.4)	34 (27.6)	<0.001
	Lower disadvantage	47 (37.6)	89 (72.4)	
PGT-A Testing	No	91 (86.7)	63 (60.0)	<0.001
	Yes	14 (13.3)	42 (40.0)	
Implantation	No	55 (55.6)	33 (37.5)	0.020
	Yes	44 (44.4)	55 (62.5)	
Pregnancy loss	No	23 (57.5)	37 (82.2)	0.024
	Yes	17 (42.5)	8 (17.8)	

\* Only variables with statistically significant differences (p < 0.05) are shown. Additional variables were examined but were not statistically significant.

**Table 2.** Stepwise regression analysis of factors associated with IVF discontinuation (>365 days)

Model	Factor	Whole Cohort
<b>MODEL 1</b>	SES Composite Score	1.12 (1.04, 1.22), p = 0.005
<b>MODEL 2</b>	SES Composite Score	1.1 (1.01, 1.2), p = 0.036
	Age at IVF start (yrs)	1.03 (0.97, 1.09), p = 0.322
	Race (Ref = Non-Hispanic Black) Non-Hispanic White	0.97 (0.55, 1.73), p = 0.916
	Relationship Status (Ref = Married) Single	1.68 (0.92, 3.07), p = 0.092
<b>MODEL 3</b>	Model 2 +	
	Insurance Coverage (Ref = Any coverage) No coverage	1.48 (0.86, 2.58), p = 0.159
<b>MODEL 4</b>	Model 3 +	
	Cycle Outcome (Ref = Cycle Cancellation) No viable / normal embryos	2.73 (0.96, 8.2), p = 0.064

**Table 3.** Stepwise regression analysis of factors associated with delayed return to care (>6 mo or no return)

Model	Factor	Whole Cohort
<b>MODEL 1</b>	SES Composite score	1.13 (1.05, 1.23), p = 0.002
<b>MODEL 2</b>	SES Composite Score	1.1 (1.01, 1.2), p = 0.034
	Age at IVF start (yrs)	1.02 (0.96, 1.08), p = 0.459
	Race (Ref = Non-Hispanic Black) Non-Hispanic White	0.8 (0.46, 1.42), p = 0.445
	Relationship Status (Ref = Married) Single	1.82 (0.46, 1.42), p = 0.445
<b>MODEL 3</b>	Model 2 +	
	Insurance Coverage (Ref = Any coverage) No coverage	1.33 (0.77, 2.31), p = 0.304
<b>MODEL 4</b>	Model 3 +	
	Cycle Outcome (Ref = Cycle Cancellation) No viable/normal embryos	2.96 (1.05, 8.81), p = 0.044

## LIMITATIONS

- **Generalizability:** Findings reflect patients from a single academic IVF center and may not be generalizable to other clinical settings or broader populations.
- **Sample Size:** Stratified analyses may have been underpowered, limiting the ability to detect statistically significant association.
- **Residual Confounding:** Although multivariable models adjusted for key demographic and clinical factors, unmeasured confounders may influence treatment discontinuation.

## CONCLUSIONS

- The composite socioeconomic status (SES) score demonstrated a stronger influence than race alone
- Cycle outcome emerged as a single independent predictor for delayed return to care
- Insurance coverage demonstrated limited independent influence on IVF continuation and delayed return to care
- Addressing these gaps requires approaches that target cycle-specific and socioeconomic barriers to improve treatment and timely return to care

## REFERENCES

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