Comparative effectiveness of residential versus outpatient treatment for pregnant substance abusers

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OBJECTIVE

The objective of this study was to compare effectiveness of outpatient *versus* residential substance abuse treatment for pregnant women with chemical dependency.

BACKGROUND

There is evidence that treatment can be effective for female substance abusers. However, few (if any) data are available regarding the comparative effectiveness of residential *versus* outpatient treatment for pregnant women with substance abuse problems.

Residential treatment by definition, provides shelter and reduces availability of substances (such as alcohol) while delivering care for chemical dependency.

On the other hand, residential treatment removes clients from their usual home and work environments and is more expensive than outpatient care.

While not focusing on pregnant substance abusers, studies have generally found little difference in outcomes for residential *versus* outpatient chemical dependency treatment.

Some "matching" studies have suggested that residential services may be counter-productive for certain substance abuse patients.

However, research has also suggested that client factors (such as addiction severity) may moderate treatment impact so that sub-groups of substance abusers differentially benefit from residential (*versus* outpatient) care.

These issues have rarely (if ever) been addressed for pregnant female substance abusers. Randomized trials are unlikely because a typical treatment agency might serve (at most) a handful of pregnant clients each year. But observational studies must deal with non-random assignment to residential care (endogeneity). This project employed national data to address these issues.

METHODS

Retrospective longitudinal observational study using national datasets.

Data

Treatment Episode Data Set – Discharges (TEDS-D)

- Linked admission and discharge information from nearly all 13,000 publicly funded U.S. substance abuse treatment programs

- Discharges 2006 through 2008 from 41 states

- **Primary outcome measure:** reason for discharge (optimal *versus* sub-optimal)

  - Optimal discharge
    - treatment completion
    - transfer to another treatment program

  - Sub-optimal discharge
    - treatment termination by client against professional advice
    - termination by treatment program
    - removal from program by law enforcement authorities
    - death

- **Predictors**
  - Client demographics and clinical measures
  - Treatment episode characteristics
  - Geographical indicators (Core Based Statistical Area or rural area within each state)

National Survey of Substance Abuse Treatment Services (N-SSATS)

- Administrative data from the overwhelming majority of publicly funded U.S. substance abuse treatment agencies

- **Key variables (by geographic area)**
  - Residential service availability
  - Special services for women and-or for pregnant women

Sample

Pregnant female discharges from outpatient (regular or intensive) or residential (short- or long- term) treatment at publicly funded facilities 2006 through 2008 (in 237 geographic areas with at least one pregnant discharge)

Analyses

- Descriptive statistics and Chi-squared tests

- Multi-level models addressing dependence among treatment agencies

- Two-stage residual inclusion approach (due to endogeneity)
  - Two-step method based on instrumental variable
  - Logistic models (non-linear)
  - First stage = residential *versus* outpatient treatment (from TEDS-D) predicted with geographic area agency data (from N-SSATS)
  - Residual = observed treatment – predicted probability of residential treatment
  - Second stage = multi-level logistic model of discharge including residual

RESULTS

Table 1 shows there were substantial differences in demographics, clinical characteristics, and chances of optimal discharge among pregnant women in residential *versus* outpatient programs. Bi-variate analyses suggested residential treatment favored optimal discharge.

Facility information (i.e., fraction of clients receiving residential care) from N-SSATS was a powerful predictor of residential *versus* outpatient treatment in TEDS-D (e.g., F (1,207) = 18.6 for 2007)

Table 2 shows that differences in optimal discharge (favoring residential care) persisted after adjustment for individual characteristics and lack of independence among facilities in multi-level models. However, when endogeneity was addressed in multi-level residual inclusion models these outcome differences were no longer statistically significant.

Table 1. Pregnant female discharges

	Outpatient	Residential	
	(N = 28,012)	(N = 11,340)	
Age			p < 0.01
12-17	5.5%	2.1%	
18-29	67.3%	67.9%	
30-39	23.1%	26.6%	
40-49	3.6%	3.1%	
50 plus	0.5%	0.3%	
Race			p< 0.01
White	61.6%	59.4%	
Black	21.0%	21.5%	
Other	17.4%	19.1%	
Latina	16.6%	15.7%	p = 0.03
Married	10.3%	8.0%	p < 0.01
High school or more	52.9%	51.9%	p = 0.76
Employed (full or part)	16.8%	4.5%	p < 0.01
Census region			p < 0.01
Northeast	17.2%	13.9%	
Midwest	23.3%	19.5%	
South	25.0%	27.7%	
West	34.4%	38.9%	
Criminal justice referral	34.6%	30.7%	p < 0.01
Psychiatric problem	29.2%	30.4%	p = 0.02
Primary substance			p < 0.01
None	0.8%	0.1%	
Alcohol	16.6%	11.3%	
Cocaine/crack	14.4%	28.6%	
Marijuana/hashish	25.0%	13.3%	
Heroin/other opiates	20.3%	14.4%	
Methamphetamine	21.5%	30.5%	
Other	1.5%	1.6%	
First treatment episode	41.5%	36.2%	p < 0.01
Optimal discharge	54.1%	61.8%	p < 0.01

Table 2. Multi-level logistic regression models

	Odds Ratio	95% Confidence Interval	p-value
Multi-level only			
Residential treatment (bottom level)	1.37	(1.22, 1.54)	0.01
Residential fraction (top level)	1.25	(0.50, 3.32)	NS
Women's services fraction (top level)	0.69	(0.37, 1.28)	NS
Pregnant services fraction (top level)	1.22	(0.53, 2.83)	NS
Multi-level residual inclusion			
Residential treatment (bottom level)	1.33	(0.70, 2.50)	NS

Dependent variable (bottom level) is optimal *versus* other than optimal discharge

Models are all multi-level with discharge the bottom level and geographic area the top level. Geographic areas are Core Based Statistical Areas (formerly known as Metropolitan Statistical Areas) or rural parts of each state. All geographic areas have at least one pregnant female discharge during the study years.

Models are all adjusted at the level of the discharge for age, race, ethnicity, education, marital status, employment, census region, criminal justice referral, co-occurring psychiatric problem, primary substance of abuse, and first treatment episode (from TEDS-D).

Multi-level only models are also adjusted at the top level for geographic area fraction of residential clients (of residential plus outpatient clients), fraction of agencies in the area with special services for women, and fraction of agencies with special services for pregnant women in the geographic area (from N-SSATS).

Residual inclusion models are multi-level without top level predictors.

Data sources:

Substance Abuse and Mental Health Services Administration
Center for Behavioral Health Statistics and Quality (formerly Office of Applied Studies)
Substance Abuse and Mental Health Data Archive at the University of Michigan

Treatment Episode Data Set – Discharges 2006 through 2008 (41 states)
National Survey of Substance Abuse Treatment Services 2006 through 2008

CONCLUSIONS

In two-stage multi-level models addressing both endogeneity and dependency among agencies, it appears that residential treatment offers no differential improvement in chances of optimal discharge for pregnant women with substance abuse problems.

Policy makers and funders may wish to consider creation of outpatient programs tailored for the needs of this group.