Variables Associated with Treatment Outcome in a Sample of Female Offenders

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Abstract: Using discriminant analysis, data collected from incarcerated female substance abusers (N = 100) are examined to explore the relationship between substance abuse and trauma. Participants were identified as belonging to one of three groups: incarcerated females waiting substance abuse treatment ($\underline{n}$ = 36); incarcerated females who have completed substance abuse treatment ($\underline{n}$ = 43); and, incarcerated females who did not complete substance abuse treatment ($\underline{n}$ = 21). Three variables associated with measures of emotional issues (depression, self esteem, and post traumatic stress disorder) and three demographic/background variables (history of domestic violence, prior substance abuse treatment, and prior criminal charges) were identified as having the strongest potential to discriminate between offenders who completed treatment and those who did not enter or did not complete treatment. Implications of these findings for determining treatment needs are discussed.

keywords: Substance abuse, trauma, domestic violence, treatment failure.

INTRODUCTION

Women represent a rapidly growing segment of individuals incarcerated in the United States. Much of this growth is related to drug law violations and substance abuse problems among this population. While the mandatory drug sentencing laws were designed to rid society of drug dealers and major players in the illegal drug trade by specifying that anyone caught in possession would automatically be sentenced, an unanticipated product of these policies has been an explosive increase in the number of women who are incarcerated. Since 1986, the number of women incarcerated for drug offenses rose by more than 800% (Covington, 2001). Between 1990 and 1996 women convicted of drug possession increased by 41%, noting that 1 in 3 incarcerated women were serving time for a drug related offense (U.S. Department of Justice, 1999a). In a 1997 survey, 40% of female jail inmates were under the influence of drugs at the time of their offense (U. S. Department of Justice, 1999b). Although it is readily apparent that while the proportion of incarcerated women is growing at an alarming rate, relatively little attention has been given to this population and they remain underserved when compared to incarcerated men (Kane & DiBartolo, 2002).

Historically, the majority of services, and institutions within the correctional setting were designed for male offenders. Looking at incarcerated female offenders as a group, Jordan, Schlenger, Fairbank, & Caddell, 1996: and Teplin, Abram, & Mc Clelland, 1996 document that female inmates are five to eight times more likely to abuse alcohol than women in the general population, ten times more likely to abuse drugs and 27 times more likely to use cocaine.

Multiple studies of gender differences have established that patterns of criminal behavior, personality, and overall life experiences vary between male and female offenders as do treatment needs and that the vast majority of criminal justice facilities fail to deliver services that address the substance abusing female offender population (Ashley, Marsden, & Brady, 2003; Green, Miranda, Daroowalla, & Siddique, 2005; Sanders & McNeill, 1997). Little is known about variables associated with treatment success or failure and to date, much of the research on incarcerated female offenders has been descriptive in nature, identifying characteristics of the population or the treatment process (Covington, 2001; Green *et al.*, 2005).

Incarcerated female offenders

Women substance abusers experience more significant emotional distress, depression, and self esteem problems than male addicts (De Leon & Jainchill, 1982; Falkin *et al.*, 1994; Mc Clellan, Farabee, & Crouch, 1997; Ransom, Schneider, & Robinson-Sanford, 1996). Up to 80% of women seeking substance abuse treatment report histories of sexual and/or physical assault, with the majority of those women experiencing symptoms of post traumatic stress disorder (PTSD) (Hien, Cohen, Miele, Litt, & Capstick, 2004). In addition, Winfield, George, Swartz, & Blacer, 1990, have noted that histories of sexual abuse, which have been linked to the development of both substance abuse and mental health problems are more common among women. Considerable research has linked a history of childhood abuse, specifically sexual abuse, to the development of alcohol and drug abuse, and criminal behavior for women (Dembro *et al.*, 1987; Dembro, Derke, Border, Washburn, & Schmeidler, 1988; El-Bassel, Ivanoff, Schilling, Gilbert, & Chen, 1995; Mc Clellan *et al.*, 1997). Women with substance abuse problems have been found to have high rates of

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repeated trauma (Grice, Brady, Dustan, *et al.,* 1995; Fullilove, Fullilove, & Smith, *et al.,* 1993).

Incarcerated women experience rates of victimization that exceed non-incarcerated female populations. Research by Jordan *et al.,* 1996; Lake, 1993; and Singer *et al.,* 1995 has found that 78% to 85% of incarcerated women have experienced at least one traumatic event, compared to 69% of the general female population. Childhood abuse has been found to be common among incarcerated women, with 23% to 48% of women prisoners reporting such abuse (Greenfield, & Minor-Harper, 1991; Singer *et al.,* 1995). It is not surprising that rates of Post Traumatic Stress Disorder, which is closely related to abuse and victimization, are also high among the female prison population. Telpin, *et al.,* 1996 found that among jail detainees PTSD had a prevalence rate of 33% lifetime and 22% for the current admission. These rates of PTSD are more than three times higher than the rates of PTSD reported by Kessler *et al.,* 1995, in a community sample of women. Additional data reveal that in a population of individuals suffering from alcohol dependence, women, are more than twice as likely as men to have experienced PTSD during their lifetime (Kessler *et al* 1995). The co-occurrence of substance abuse disorders and PTSD among incarcerated women has been found to be quite high (Zlotnick, 1997). Rates of current PTSD among clients in treatment for substance use disorders range from 11% to 59% (Najavits *et al.,* 1997). Research has consistently shown that substance dependent individuals with co morbid PTSD evidenced a more severe clinical profile and worse treatment prognosis than individuals with substance use disorder alone (Brady, Killen, Saledin, Dansky, & Becker, 1994).

Commonly occurring conditions among incarcerated substance abusing women include, physical abuse, sexual abuse, serious emotional problems, depression, experiences of trauma, and PTSD. Though the clinical literature discusses these factors in detail, empirical investigations exploring their relationship to substance abuse treatment are noticeably absent. Given this omission, the purpose of the present study is to investigate whether these conditions are related to treatment outcome.

METHOD

Participants

Participants in this study were 100 incarcerated females recruited from two correctional facilities housing a residential substance abuse treatment program on the grounds of their respective institutions. All potential participants approached for the study gave their written consent and were informed that their status in treatment or parole eligibility was not contingent on participation in the study. Participants were classified as belonging to one of three groups: incarcerated females waiting substance abuse treatment (hereinafter, Group 1, $\underline{n}$ = 36); incarcerated females who have completed substance abuse treatment (hereinafter, Group 2, $\underline{n}$ = 43); and, incarcerated females who did not complete substance abuse treatment (hereinafter, Group 3, $\underline{n}$ = 21). Potential participants who did not meet the criteria for one of the three designated classifications were eliminated from the study.

Measures

Addiction Severity Index

The Addiction Severity Index, 5th edition (ASI) (McLellan *et al.,* 1992) was used to measure severity of drug and alcohol use and impairment in five associated areas (family/social, legal, and employment, psychological, medical). Scores on the ASI are composites summarizing across the variables in each of the seven major problem areas. Participants in this study were administered the ASI at intake to incarceration and were asked to focus on the 30 day time period prior to their incarceration.

Beck Depression Inventory

The Beck Depression Inventory (BDI) (Beck, 1967) is a 21-item, forced choice inventory that is a widely used measure of depression. While the scale originally was developed to identify clinically depressed individuals, it has been validated for use with nonpsychiatric populations with well established reliability and validity (Beck, Steer, & Garbin, 1988). The BDI scores range from 0 to 39, with higher scores being indicative of more severe levels of depression.

Trauma Life Events Questionnaire

The history of traumatic events was measured by the Traumatic Life Events Questionnaire (Kubany, 2004). This instrument assesses exposure to a broad spectrum of 21 potentially traumatic events. The Traumatic Life Events Questionnaire (TELQ) is comprised of 24 items developed from multiple sources of information to enhance content validity across the domain of important traumatic events. Respondents indicate whether they had the life experience and if so, at what frequency. The TLEQ does not produce a formal test score. Kappa coefficients for substance abuse populations ranged from .60 to .91.

The PTSD Screening and Diagnostic Scale

The PTSD Screening and Diagnostic Scale (PSDS) (Kubany, 2004) is a 38 item self report questionnaire for assessing PTSD symptoms and detecting the presence of PTSD as defined by the DSM-IV diagnostic criteria. Respondents are instructed to indicate the degree to which they experience each of the symptoms in the past 30 days. Respondents are given five response options to each symptom question that range from 0 = "Absent or did not occur" to 4 = "Present to an extreme or severe degree." Respondents are also asked whether they have experienced PTSD symptoms for longer than 30 days. In four separate samples of physically and/or sexually abused women, the Cronbach's alpha coefficient ranged from .80 to .91 PSDS.

Rosenberg Self Esteem

The Rosenberg Self Esteem Scale (Rosenberg, 1965) is a 10 item scale designed to assess general feelings of self acceptance and self respect. The scale generally has high reliability: test-retest correlations are typically in the range of .82 to .88, and Cronbach's alpha for various samples are in the range of .77 to .88. Scores range from 0 to 30 with lower scores being indicative of lesser feelings of self acceptance and respect.

Background Information

Participant background information was obtained from both record review and participant interviews. Background characteristics from official records included race, ethnicity, prior criminal history, marital status prior to incarceration, history of domestic violence victimization, employment history, educational attainment, type of drug used prior to arrest, history of prior treatment for drug and/or alcohol, and history of substance abuse in family.

Procedure

The study was exploratory in nature and employed a separate sample pretest posttest design. Though not inherently strong, the design is considered worth while and represents a feasible alternative for the researcher in field settings (Campbell and Stanley, 1963). Data were collected in two stages; the first involved a record review to collect demographic, criminal history, and ASI scores on study participants. The second stage of data collection involved a direct contact protocol with the participants. Both the participant and researcher had a copy of the study questionnaire. Each question was read aloud by the investigator while the participant marked her answers on a reply sheet.

RESULTS

Participant Characteristics

The age of participants ranged from 21 to 46 years with a mean age of 32.8 years (SD = 4.8). The majority of participants were either African American (59%) or Caucasian (26%). Over 65% of the women had not completed high school and over 10% reported less than an eighth grade education. Only 16% of the women were currently married while 56% reported living with a partner prior to their incarceration. Less than half of the participants reported being employed prior to their incarceration in either full time or part time positions. One third of the participants (31%) had a history of prior treatment for substance abuse. Table **1** outlines the characteristics on all demographic and background variables for the sample as a whole and for the three sub-samples.

Discriminant Analysis

In order to assess possible differences between groups, One Way Analysis of Variance was conducted on demographic and background variables. No Significant differences were observed among the three groups for any of the demographic or background variables. Discriminant

Table 1.   Demographic and Background Variables: Total Sample and Sub-Samples

Variable	Total Sample (N = 100)	Group 1 Pre-Treatment (n = 36)	Group 2 Post Treatment (n = 43)	Group 3 Did not Complete Treatment (n = 21)
M Age	32.8	29.7	35.5	32.9
Race				
Caucasian	26.2%	26.9%	28.3%	21.9%
African American	58.8% 8.2%	56.5% 6.2%	61.7% 4.8% 5.2%	58.1%
Latino	7.3%	10.2%		13.4%
Other				6.6%
Full Scale IQ (M Score)	80.8	82.3	80.7	79.2
History of Domestic Violence	77.4%	75.9%	77.5%	80.2%
History of Substance Abuse Treatment	31.4%	32.2%	30.7%	31.7%
Prior Criminal Charges	46.7%	46.2%	47.3%	46.5%
Education (highest grade completed)	2.3%	1.2%	1.1%	4.5%
Primary (1-6)	9.4%	9.2%	6.6%	12.3%
Intermediate (7-8)	21.5%	23.5%	18.1%	24.1%
High school	15.8%	15.2%	13.5%	18.8%
9	18.1%	19.9%	15.1%	20.5%
10	30.1%	33.6%	36.1%	20.7%
11	2.8%	2.9%	5.2%	0.0%
12				
More than high School				
Employed Prior to Incarceration	48.8%	58.7%	76%	10.2%

analysis is a statistical technique which allows investigation of differences between two or more groups relative to several variables simultaneously. Linear combinations of the independent or predictor variables are formed and serve as the basis for classifying cases into one of the groups under investigation. Data from the 5 scales, demographic, and background variables were entered by using a stepwise entry procedure that minimizes Wilks's lambda. An assumption of discriminant analysis is that the covariance matrices are equal for the different groups. Box's M statistic for the equality of covariance matrices for these data resulted in an acceptance of the null hypothesis, revealing no violation of this assumption (Box's M = 17.71486, $\underline{p}$ = .1572).

Interpretation of Functions

Two functions were identified through discriminant analysis: Function 1 comprised of the PTSD Screening and Diagnostic Scale, the Rosenberg Self Esteem Scale, history of domestic violence victimization and Beck Depression Inventory and Function 2 is comprised of criminal history and history of prior substance abuse treatment variables. Table **2** displays the results of the discriminant analysis. Although two functions emerged, three statistical indicators suggest that Function 1 is more important. First, Function 1 explains 79.74% of the explained variance among predictor variables, indicating that this function provides substantially more information about group differences than Function 2 (20.26% of the explained variance). Second, the canonical correlation coefficient, a measure of the degree of association between the discriminant scores and the groups, was .84 for Function 1 compared to .35 for Function 2. The third indicator is found in Wilks's lambda, a measure of the discriminating power in the predictor variables, which are .27 for Function 1 and .82 for Function 2. Because lambda is an "inverse" measure, values near zero denote higher discrimination.

The standardized coefficients and pooled with-in group correlations are useful in interpreting the meaning of function. In order to understand the relative contribution of each original variable to the discriminating function, the

Table 2. Discriminant Model: Percent of Variance, Canonical Correlations, Wilks's lambda, and Significance Level for Functions

	Function 1	Function 2
Percent of Variance	79.74%	20.26%
Canonical Correlation	.84	35
Wilks lambda	.27	.82
Significance Level	$\underline{p}$ < .001	$\underline{p}$ = .001

standardized discriminant coefficients must first be examined. Based on these coefficients, the PSDS reveals a contribution of .814, the Rosenberg Self Esteem Scale a contribution of .665, history of domestic violence victimization a contribution of .413, and the Beck Depression Inventory a contribution of .315 to Function 1. Prior criminal history reveals a contribution of .769 and history of prior substance abuse treatment makes a contribution of .311 to Function 2. Table **3** provides information on the standardized coefficients and correlations with discriminant functions.

A second major purpose of discriminant analysis is to determine the potency of correct classifications of cases to appropriate group status. How well do the discriminant functions allow one to identify the group to which a case most likely belongs? The discriminant functions achieve a relatively high percentage of correct classifications, 86% of the overall sample. In predicting specific group membership, the model most successfully classifies 88% of Group 1 members, 90% of Group 2 members, and 89% of Group 3 members. Table **4** presents the classification results.

DISCUSSION

There are several limitations that should be noted in this study. Though the utilization of a separate sample pretest-posttest design is appropriate when the researcher is unable to control the assignment of treatment, there is no control

Table 3. Correlation of Predictor Variables With Discriminant Functions and Standardized Discriminant Function Coefficients

Predictor Variable	Correlation with Discriminant Function		Standardized Discriminant Function Coefficient	
	Function 1	Function 2	Function 1	Function 2
PSDS	.974	.087	.814	.139
Rosenberg Self Esteem Scale	.715	.183	.665	.183
History of Domestic Violence	.614	.082	.413	.069
Beck Depression Inventory	.601	.021	.315	.041
Prior Criminal History	.019	.885	.244	.769
History of Prior Substance Abuse Treatment	.084	.674	.311	.544

Table 4. Classification Analysis for Groups

Actual Group Membership	n	Predicted Group Membership		
		1	2	3
Group 1 Pre-treatment n %	36	32 87.5	0 0	4 12.5
Group 2 Post-treatment n %	43	2 4.8	39 90.4	2 4.8
Group 3 Failed Treatment n %	21	1 6.6	1 6.6	19 89.2

Note. Overall Percentage of Correctly Classified Cases = 86.3%.

group or random assignment of participants. Thus, control of extraneous factors is not as strong as in experimental designs. Limitations related to sampling concern the use of a nonprobability purposive sample. The sample employed in the current study represents those offenders who were considered too high a risk for remaining in the community; therefore, the sample may be comprised of one "extreme" or profile of female offender. Thus, conclusive statements about the total female substance abuse offender population cannot be made.

The study's findings suggest that past victimizations and subsequent emotional conditions (PTSD, depression, and self esteem) have the strongest potential to distinguish treated from untreated female offenders. Two functions emerged from the model investigated, with the most powerful discriminant function, reflecting 79% of the variance, being comprised of the instruments assessing PTSD, depression, self esteem, and past victimization. An ongoing controversy exists in both the trauma and addiction fields regarding which disorder to treat first with proponents for either side insist that one condition exacerbates the other (Hien, *et al.*, 2004). Findings from the present study concur with the premise that women with comorbid psychological problems face a higher risk of treatment failure (Kubiak, 2004; Pelissier, 2004).

Results of this study are consistent with a considerable body of knowledge related to women substance abusers and trauma (Jordan *et al.*,1996: Telpin, *et al.*, 1996: De Leon and Jainchill,1982: Falkin *et al.*, 1994; Mc Clellan, Farabee, & Crouch, 1997; Ransom, Schneider, & Robinson-Sanford; 1996; Hein, Cohen, Mielle, Litt, & Capstick, 2004). In addition, that body of knowledge further documents that incarcerated women have experienced even greater exposure to trauma, domestic violence, related depression and lower self esteem than comparable samples of non incarcerated women (Jordan *et al.*,1996: Lake,1993: Singer *et al.*,1995).

This study looks at a group of women (n = 100) who are currently incarcerated and for whom we have data related to their outcome in a substance abuse treatment program offered by the correctional system. The outcome data reveal that those women who experienced higher rates of PTSD, have lower scores on self esteem, have a stronger history of domestic violence victimization and were more seriously depressed, experienced higher rates of treatment failure.

These findings suggest that substance abuse treatment of incarcerated women must be focused on treating, not only the substance abuse issues, but also must address these serious coexisting conditions in order to have any chance of success. Substance abusing women who are convicted and come to a prison treatment program have also experienced numerous emotional and psychiatric conditions which make their substance abuse treatment much more difficult. Current substance abuse treatment protocols understand that the treatment needs of individuals who have a psychiatric disorder in combination with an alcohol and/or drug abuse disorder differ significantly from individuals with either a substance abuse disorder or a mental health disorder alone.

Treatment for coexisting disorders has been delivered in three different ways: (1) Sequentially, which addresses either the substance abuse disorder or mental health disorder first and the remaining disorder second; (2) Parallel, which has a specialized program for treating each disorder individually. The client participates in the treatment of both disorders simultaneously but the treatment is done by each specialty in a separate program; and, (3) concurrently, where both types of disorders are addressed simultaneously in the same program structure at the same time. The concurrent model appears to be the most feasible in a prison setting because it provides a comprehensive assessment including both substance abuse issues and coexisting emotional and psychiatric conditions. The failure to address coexisting issues has an impact on treatment outcome, more specifically, it appears to enhance the risk of treatment failure. According to Riles (1994) effective treatment of coexisting conditions requires a program which includes the following major goals:

1) Engages the client in the process.

2) Accommodates various levels of severity.

3) Accommodates various levels of motivation and compliance.

4) Accommodates clients in different phases of the treatment process.

This study reveals that a positive treatment outcome for substance abusing women conducted in a prison setting requires a sophisticated treatment program. Such a program addresses both the substance abuse issues and serious coexisting conditions which often occur in this population.

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