Level of Burden Among Women Diagnosed with Severe Mental Illness and Substance Abuse†

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Abstract—Women diagnosed with severe mental illness and substance abuse may face a variety of associated difficulties that require intervention, including other health-related problems, housing instability or homelessness, and a history of or current physical or sexual abuse. This article expands upon the concept of "level of burden" by specifically examining issues for women with multiple vulnerabilities in a sample of 577 women participating in a residential substance abuse treatment program. Two types of outcomes were examined for the women. In Study 1, the effects of severe mental illness as well as overall level of burden on retention in treatment were examined. Cox regression analyses revealed that severe mental illness was significantly related negatively to retention in treatment; those women diagnosed with severe mental illness tended to stay in treatment less time than those without such a diagnosis. In Study 2, staff ratings of the women's status at departure from residential treatment for a subsample of 311 women were examined with respect to overall retention in treatment and severe mental illness. Ratings of client status at program exit were significantly related to time in program but were not related to having a severe mental illness diagnosis. For a few indicators (e.g., leaving treatment against advice, having scattered or disorganized thoughts, and having no specific plans for life outside of treatment), there was an interaction between time in program and severe mental illness such that women with severe mental illness who were retained for less than 180 days were more likely to demonstrate negative outcomes. Implications for the treatment of multiply-diagnosed women are discussed.

Keywords—multiple diagnoses, substance abuse, severe mental illness, treatment outcomes, women

Two national epidemiological studies have estimated that a sizable percentage of people with a diagnosed addictive disorder also had at least one mental disorder, and a

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sizable percentage of people diagnosed with a mental disorder had at least one addictive disorder (Kessler et al. 1996; Regier et al. 1990). In addition, it has been shown that individuals with a dual diagnosis frequently seek treatment, but have relatively poor treatment outcomes (Carroll et al. 1993; Drake, Alterman & Rosenberg 1993; Narrow et al. 1993; Rounsaville et al. 1991; Rounsaville et al. 1987; McLellan 1986). It should be noted that more than 40% of those with three or more mental disorders have never received any treatment (Kessler et al. 1994).

Studies are also beginning to address the important issues of gender, as well as co-occurring disorders. Women are more likely to experience higher rates of co-occurring disorders than men; it is estimated that one in 12 women

over the age of 18 may be diagnosed with a serious mental illness in any given year, compared to one in 20 men (Carmen 1994; Regier et al. 1990; Helzer & Pryzbeck 1988). Among dually-diagnosed, severely mentally ill patients, women tend to be more frequently diagnosed with affective disorders, whereas men tend to be more frequently diagnosed with schizophrenia (Comtois & Ries 1995). Among men and women diagnosed with alcohol abuse or dependence, 65% of women compared with 46% of men had a second diagnosis (Goodwin 1996; Anthony & Helzer 1991; Helzer, Burnam & McElvoy 1991). Women diagnosed with two disorders are more likely to be diagnosed with a third problem—physical and sexual abuse (Brown, Huba & Melchior 1997; First et al. 1997; Kessler et al. 1996; Zweben, Clark & Smith 1994; Dembo et al. 1987). Co-occurring disorders in women with histories of trauma are associated with high rates of posttraumatic stress disorder or PTSD (Teets 1995; Windle et al. 1995; Wolfe & Brown 1994; Fullilove et al. 1993).

Moreover, women with multiple vulnerabilities have a wide range of associated problems that require intervention, such as housing instability and homelessness, physical health problems, risk for HIV/AIDS, and problems with childcare (Nicholson, Sweeney & Geller 1998; Brown 1997; Bartels et al. 1993; Drake & Wallach 1989). The greater the number of vulnerabilities a woman experiences, the more likely it is that some misdiagnosis will take place, and, therefore, the more likely it is that inadequate treatment will follow. Poor treatment outcomes may also be a function of the severity of the symptoms of mental illness, thereby interfering with the women's complete participation in treatment. In addition, the women with multiple vulnerabilities may receive insufficient treatment given their level of dysfunction (Lidz & Platt 1995; Alterman, McLellan & Shifman 1993).

A major issue in substance abuse treatment is the ability to retain women in treatment for the full course of their program (De Leon & Schwartz 1984; Huba, Melchior & Brown In review). Because the needs of all women substance abusers—and especially those with higher levels of "burden"—are great and multifaceted, a comprehensive and long-term program of treatment is needed. To meet the needs of women addicts and their children, the PROTOTYPES Women's Center has developed specialized services. These services provide a supportive environment for a woman and her dependent children as she assumes a drug-free life, learns to cope with stress without drugs and alcohol, develops daily living skills and the ability to hold a job, and learns to understand and improve her role as a parent. Because women addicts and alcoholics and their children must cope with many different issues, PROTOTYPES has developed a complex program that seeks to provide needed services to a woman *when she is most ready to learn new skills, attitudes, and coping strategies*. Concurrently, a woman is immersed in an intensive recovery program embodying the state of the art in current social model principles where women in different stages of their own recovery help other women. While there is a core program, women's individual trajectories through the program may vary, as the environments they must face after the program will vary. The program is organized as a progression through four phases, each of which builds on skills learned in previous stages of treatment.

In this study, we examine the ability to retain women in treatment as a function of burden level. In prior analyses of these data (Huba, Melchior & Brown In review; Melchior, Huba & Brown 1994), we have shown that the race of the individual does not impact upon the ability to retain her in the program, but that the presence of active criminal justice supervision does (in a positive manner). Additionally, the drug of preference and the overall personality profile of the client was related to her retention in the program. In these analyses, we ask if severe mental illness, as well as the overall level of "burden" (the total number of "diagnoses" or "significant problems") impacts upon the number of days that the client can be retained in the program. The technique of survival analysis (using Cox regression) is used. A fuller description of this method and its use in assessing program retention appears in an article by Huba, Melchior, Brown and Hughes (In review).

STUDY 1

Method

A sample of 577 women who received services from a comprehensive residential drug treatment program (PROTOTYPES Women's Center in Los Angeles) with their children was followed from October 1, 1992 to March 21, 1998. The major variables for which data were collected included demographic characteristics, substance abuse history and current use (prior to admission), psychological problems, general health status, and HIV/AIDS status. This group of women had an average age of 30.7 years. In this sample, 41.8% were African-Americans, 24.1% were Latinas, 31.7% were Caucasians, 0.5% were Asian-Americans, 0.5% were Native Americans, and 0.9% had another ethnic/racial background. The women were retained an average of 213.9 days in treatment.

Measures

Demographic characteristics and brief substance abuse history. Background data—including women's racial/ethnic identity, drugs of choice prior to entering treatment, and homeless status—were collected at program intake using a standard form that is used to contribute data to the Federal minimum dataset (Client Data System). In addition, the client's HIV status at intake was noted if known.

Medical problems. A Health Questionnaire completed by the treatment program medical staff was used to indicate the health history of each client. This information was collected within 30 days of a woman entering the residential treatment program.

Psychosocial assessment. Within the first 30 days of entering the residential treatment program, a detailed psychosocial assessment was completed by program clinical staff. The psychosocial assessment included information about the woman's general mental status and presentation, history of sexual and/or physical abuse, and DSM-IV clinical diagnoses.

Program retention. For the present analyses, program retention was indicated as the number of days women had been retained in the residential treatment program as of March 21, 1998. Time in treatment was measured as the number of days in the program at that date.

Coding Level of Burden

One "point" was given to an overall index of burden for the client for each of a number of conditions that were present.

To represent psychological problems or diagnoses, three separate indicators were developed. Each of the three diagnostic variables was dichotomous, coded as "1" if the diagnosis applied to the woman, and "0" if it did not. *Posttraumatic stress disorder/anxiety* was coded if diagnoses of either PTSD or anxiety disorders were identified in the psychosocial assessment; a total of 6.1% of the women met this criterion. A diagnosis of *borderline personality disorder* was coded if that was noted in the psychosocial assessment; a total of 2.1% of the women met this criterion. *Severe mental illness* was coded if one or more psychotic disorders (including schizophrenia) or mood disorders (such as major depression) were noted in the psychosocial assessment; a total of 11.8% of the women met this criterion for severe mental illness. There appeared to be very little overlap among the categories: of the women coded to have severe mental illness, 3.3% also had a diagnosis of borderline personality disorder, and none had a co-occurring diagnosis of PTSD or an anxiety disorder.

History of physical or sexual abuse was coded from the psychosocial assessment if such abuse was noted for the woman, either as a child, or as an adult. A total of 87.3% of the women had a history of abuse coded.

Health problems were coded by the presence of one or more of the following problems: gall bladder disease, cancer, diabetes, epilepsy, hepatitis, or tuberculosis. Current levels of sexually transmitted diseases are high in this population and hence were not included in the composite to avoid ceiling effects. The percentage of the women who got a positive score on this indicator was 26.0%.

A point was given for HIV status if the client was verified to be positive by a blood test conducted by the program or received from another medical provider. A total of 9.2% of the women were identified as HIV-positive.

A point was coded for homelessness if the client noted that she considered herself to be homeless at the time of admission to the program; 52.2% of the women indicated that they considered themselves to be homeless.

In addition to the factors listed above, one point each was coded to the "burden" index if the client indicated that heroin (25.8% of the women), cocaine (69.5%), amphetamines (22.9%), or alcohol (46.3%) were among her three most common drugs of abuse.

It should be noted that in the context of the analyses presented here, overall burden is coded as a simple sum of the factors listed above. Each receives the same weight in the sum, and there are many different ways that an individual client could get a particular numerical score.

RESULTS

Distribution of Burden

The average burden score was 3.6 with a standard deviation of 1.2. The distribution was as follows: 3.1% had a score of 1; 15.6% had a score of 2; 29.8% had a score of 3; 29.8% had a score of 4; 15.3% had a score of 5; 5.2% had a score of 6; 1.0% had a score of 7; and 0.2% had a score of 8.

Correlation of Burden Elements

Phi-coefficients (product-moment correlations calculated on dichotomous variables) for the burden elements are presented in Table 1. Note that the small, and largely nonsignificant coefficients indicate that the specific elements in the burden construct are not completely concomitant with one another, but rather should be considered to be a set of relatively uncorrelated risk factors.
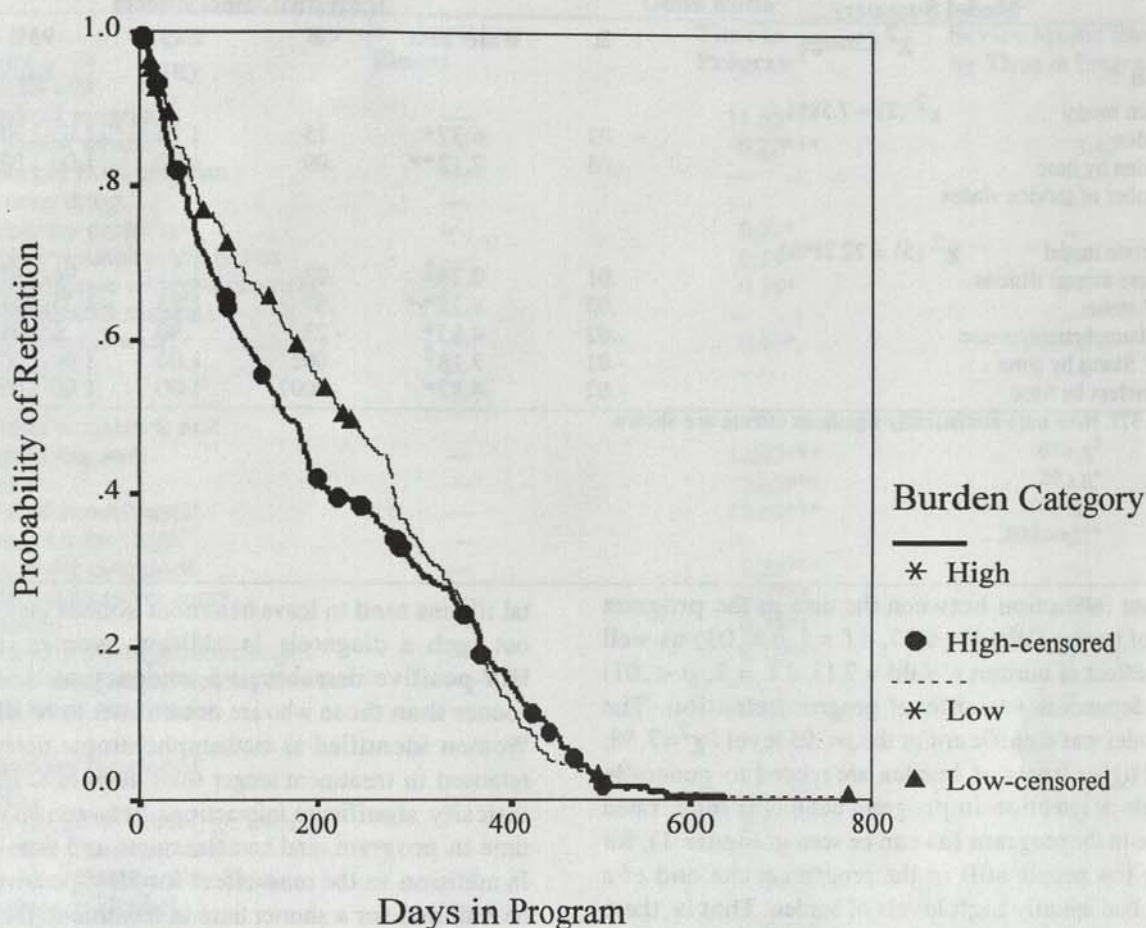
Survival Analysis

As discussed above, the longer a woman stays in treatment, the more likely her recovery will be successful. Although it is inevitable that some individuals leave treatment prematurely, those women who remain in the PROTOTYPES program progressively take on responsibilities and learn adaptive strategies that help them live drug-free outside of the residential treatment program. Does level of burden differentiate those women who remain in treatment from those who depart early? Earlier work by Brown, Huba, and Melchior (1995) examined the effect of therapeutic burden on retention and found it to be significantly related to retention in substance abuse treatment. This article extends the earlier work by adding specific diagnostic indices of mental illness to the overall concept of therapeutic burden. The general issue that survival analysis is designed to address is how long cases "survive" in the treatment program (Singer & Willet 1991). For instance,

TABLE 1
Correlation of Burden Elements

	HIV Status	Used Heroin	Used Alcohol	Used Methamphetamines	Used Cocaine/Crack	Homeless	Major Health Problems	Abuse History	Borderline	Severe Mental Illness	PTSD/Anxiety
HIV Status											
Used Heroin	.09*										
Used Alcohol	.09*	-.22**									
Used Methamphetamines	-.09*	-.16**	-.18**								
Used Cocaine/Crack	.07	.05	.06	-.63**							
Homeless	.09*	-.01	.05	.01	.01						
Major Health Problems	.07	.27**	-.03	-.05	-.02	.04					
Abuse History	-.01	.06	.01	.01	.08	.05	.04				
Borderline	-.05	.05	.04	-.02	.02	.04	.02	.06			
Severe Mental Illness	-.06	-.09*	.06	-.05	.02	.01	.03	-.01	.14**		
PTSD/Anxiety	.02	-.02	-.02	-.04	-.01	.04	.03	.08	.12**	.02	

FIGURE 1
Retention in Residential Substance Abuse Treatment for Women with High and Low Levels of Burden

treatment in the PROTOTYPES residential program can take as long as 18 months. Yet, individual women may leave the program earlier than their official graduation dates.

In survival analysis, data are presented as survival curves. A survival curve represents the percentage of clients who are still in the program after a given number of days have elapsed. Figure 1 shows two survival curves for the women participating in the residential program at PROTOTYPES from October 1, 1992, to March 21, 1998 for whom we have information on the elements of the burden construct. Some of the women seen during that period still remained in the program at the end of the time frame. In survival analysis, such cases are called "censored" ones, in that insufficient time has elapsed for all cases to have experienced the event being studied, in this case discharge from the program. The analytical procedures take into account the censored cases.

The survival curves in Figure 1 have been presented separately for two groups of women. The low burden group ($n = 280$) had one, two, or three of the burden factors; the high burden group ($n = 297$) had four or more burden factors. Figure 1 should be read as follows: the days in the

program are the actual number days the woman is in the residential program, including the day an admission form is completed as a full day. The cumulative probability of survival is the percentage of all women in that group who stay in the residential program for the given number of days. The mean retention for the low burden group was 225.79 days (standard error = 9.21 days), with a median retention of 230 days (standard error = 21.82 days). For the high burden group, the mean retention was 202.87 days (standard error = 9.50 days), with a median retention of 164 days (standard error = 14.44 days). Using traditional Kaplan Meier methods of survival analysis, the difference based on burden level was not statistically significant under the log rank, Breslow, or Tarone-Ware assumptions ($ps > .05$).

The Relationship of Program Retention to Burden

Using the more sophisticated Cox regression method of survival analysis, the effect of burden level on program retention was examined, including time in program as a covariate. Using burden as a continuous variable (ranging from one to eight in this sample) it was found that there is

TABLE 2
Event History (Cox Regression) on Level of Burden: Program Retention Rates

| Model Summary | | | Individual Model Effects | | | |
	χ^2 Change	R	Wald Test	B	Exp (B)	95% CI for Exp (B)
Model						
Burden model	$\chi^2 (2) = 7.58*$					
Burden		.03	6.37*	.15	1.16	1.03-1.30
Burden by time		-.03	7.13**	.00	1.00	1.00-1.00
Number of service dates						
Alternate model	$\chi^2 (5) = 22.28***$					
Severe mental illness		.01	2.76‡	.23	1.26	.96-1.67
HIV status		.03	8.75**	.67	1.95	1.25-3.03
Methamphetamine use		-.02	4.85*	-.23	.80	.65-.98
HIV Status by time		-.01	3.18‡	-.002	1.00	1.00-1.00
Homeless by time		-.02	4.87*	-.0007	1.00	1.00-1.00

$N = 377$. Note: only statistically significant effects are shown.
‡$p < .10$.
*$p < .05$.
**$p < .01$.
***$p < .001$.

a significant interaction between the time in the program and level of burden (Wald = 6.37, d.f. = 1, $p = .01$) as well as a main effect of burden (Wald = 7.13, d.f. = 1, $p < .01$) upon the dependent variable of program retention. The overall model was significant at the $p < .05$ level ($\chi^2 = 7.58$, d.f. = 2). Higher levels of burden are related to generally lower levels of retention in program but this is moderated by the time in the program (as can be seen in Figure 1); for those very few people still in the program at the end of a year, most had initially high levels of burden. That is, there is a statistically significant tendency for the highest burden clients to drop out of the program at early stages in the treatment regimen. If such clients make it through the initial stages of the program, they will tend to be retained longer because their treatment needs are highest.

An alternate model was tested to specifically address the relationship between the burden elements and program retention. In this analysis, each of the burden elements was entered as an independent variable in a Cox regression with a time-dependent covariate. A backwards stepwise regression analysis was used to identify which of the 11 burden elements significantly predict retention in residential substance abuse treatment. Each of the 11 elements was tested for a main effect, as well as for an interaction with the time-dependent covariate. Table 2 shows the results of both regression analyses.

Of the 11 possible burden elements, there were statistically significant main effects for severe mental illness, HIV status, and methamphetamine use. In addition, there were interactions with the time-dependent covariate for HIV status and homelessness. Positive coefficients indicate a tendency to leave treatment sooner. A statistically significant effect emerged for being diagnosed with severe mental illness: women known to have a diagnosis of severe men-

tal illness tend to leave treatment sooner than those without such a diagnosis. In addition, women known to be HIV-positive demonstrate a tendency to leave treatment sooner than those who are not known to be HIV-positive. Women identified as methamphetamine users tend to be retained in treatment longer than nonusers. There are statistically significant interactions between HIV status and time in program, and homelessness and time in program. In addition to the main effect for HIV-positive women to be retained for a shorter time in treatment, there is a point in time (after about a year in treatment) when the difference in retention no longer holds. Similarly, although there is no main effect of homelessness on program retention, as women stay in treatment for longer periods of time, those who are not identified as homeless upon admission to treatment tend to stay longer after a certain amount of time in the program (at approximately 300 days, or 10 months in treatment).

The effects of the three diagnostic categories were specifically examined in a separate Cox regression analysis in which the independent variables included the indicators of severe mental illness, PTSD/anxiety disorders, and borderline personality disorder, in addition to the interactions of each of those variables with the time-dependent covariate. A backwards stepwise regression analysis yielded a model in which the only significant predictor of retention out of the three diagnostic categories was that of severe mental illness (Wald = 2.69, d.f. = 1, $p = .10$). That is, having a diagnosis of PTSD or an anxiety disorder did not predict retention in the program, nor did having a diagnosis of borderline personality disorder. Severe mental illness, as discussed above, is a predictor for leaving the program earlier.

TABLE 3
Summary of Logistic Regressions of Severe Mental Illness and Time in Program on Program Exit Status

| | | Odds Ratio | |
Indicator	Severe Mental Illness	Time in Program[1]	Severe Mental Illness by Time in Program[2]
Reasons for exit			
Completed program	—	31.55***	—
Left against advice	—	0.20***	3.40*
Discharged from program	—	—	—
Was using drugs	—	—	—
Disciplinary problems	—	0.27*	—
Deviated/violated terms of pass	—	0.19**	—
Noncompliance with program rules	—	0.19**	—
Completed CJS mandate	—	—	—
"Went over the wall"	—	0.19*	—
De-phased	—	—	—
Description of client at exit			
Happy, doing well	—	12.42***	—
Sober	—	5.87***	—
Felt good about herself	—	20.62***	—
Appeared to be "high"	—	—	—
Emotionally distressed	—	0.28***	—
Hostile, aggressive, angry	—	0.37**	—
Depressed	—	0.35**	—
Scattered or disorganized thoughts	—	0.16***	24.28*
Worried about others coming after her	—	—	—
Doing things on impulse	—	0.23***	—
Specific plans mentioned			
None	—	0.19***	4.27*
Get a job, go to school, get training	—	4.83***	—
Get a safe place to live	—	3.88***	—
Stay out of trouble with the law	—	6.64***	—
Use drugs or alcohol	—	—	—
Go to support groups	—	6.36***	—
Go back to partner or family	—	—	—
Seek services outside PROTOTYPES	—	—	—
Seek other services from PROTOTYPES	—	2.76***	—
Go back to former environment	—	—	—
Take care of her child(ren)	—	5.11***	—

$N = 311$.

[1]Odds ratios greater than one mean that women retained in the program for a longer time are "x" times more likely to have the characteristic. Odds ratios less than one mean that women who stay in the program only a short time are "1/x" times as likely to have the characteristic.

[2]Women with severe mental illness who were retained a short time are most likely to have these characteristics.

*$p <.05$.
**$p <.01$.
***$p <.001$.

STUDY 2

Method

Of the 577 women included in Study 1, information from exit interviews was available for a subset of 311 women. The data were coded by program staff for each client at the time of departure from the residential treatment program, or immediately afterwards. Available data include an assessment of whether or not the client completed the course of treatment, whether treatment was terminated for a number of reasons, a number of observations as to the client's status at the time of program exit, and the client's plans for various types of activities post-discharge. The exit interview data were analyzed with respect to whether cli-

ents were coded as having a severe mental illness, the length of time in treatment, and the interaction of severe mental illness and time in treatment. Severe mental illness was coded in the same manner as in Study 1. To facilitate interpretation of results, time in program was coded in two categories: less than 180 days ($n = 139$) and 180 days or longer ($n = 172$). A series of backwards stepwise logistic regressions were conducted to examine the effects of severe mental illness and time in program on the various outcomes coded by staff at the clients' departure from the program.

RESULTS

Table 3 summarizes the results of a set of backwards

stepwise logistic regressions predicting a number of dichotomous outcomes from the exit interviews. For each outcome, the odds ratio associated with the outcome is shown if it is statistically significant at the $p < .05$ level. There are no significant main effects based on severe mental illness. However, the majority of indicators summarized in Table 3 show a significant main effect for time in program. Across the various indicators, the results converge to suggest that retention is associated with positive outcomes at the time of program departure. Among other positive outcomes, a client retained in treatment for more than 180 days is more than 30 times as likely as a woman in treatment less than 180 days to be considered to have completed her course of treatment; 12 times more likely to be perceived as doing well at the time of program exit; 20 times more likely to be seen as feeling good about herself; almost six times as likely to be clean and sober; almost five times as likely to have plans to get a job, go to school, or get training; and almost four times as likely to have a safe place to live. Conversely, a woman who stays in treatment less than 180 days is more likely to have left treatment against advice, to have left due to disciplinary problems, or to have left for other negative reasons. She is more likely to be perceived as emotionally distressed, hostile, depressed, mistrustful of others, and impulsive than a woman who has been in treatment for more than 180 days. She is more likely than a woman in treatment for more than 180 days to have no specific plans at the time of program departure.

In addition to these main effects, there are several interactions between time in program and severe mental illness. Specifically, women who are diagnosed with severe mental illness who remain in treatment for less than 180 days are more likely to leave treatment against advice, to be perceived by staff to have scattered or disorganized thoughts, and to have no specific plans for life outside the treatment facility. Thus, women with severe mental illness who do not stay the full course of treatment are more likely to demonstrate negative outcomes than their counterparts who are retained longer.

DISCUSSION

The present study investigated the impact of severe mental illness and substance abuse experienced by women in a comprehensive drug residential treatment program on their retention and outcomes. It is well known that the highest drop-out rates in therapeutic communities are in the early months of treatment. It was shown that the women diagnosed with severe mental illness and substance abuse tend to drop out of treatment earlier. In an earlier study, Brown, Huba & Melchior (1995) found that highly burdened women (women with multiple, co-occurring disorders) dropped out early, and they hypothesized that these women may be more easily overwhelmed by the transition required in entering a structured therapeutic community.

The study begins by investigating differences in categories of mental illness among the women. Women with diagnoses of severe mental illness (e.g., schizophrenia, bipolar illness) drop out earlier than other women in the program. Women with diagnoses of borderline personality or PTSD do not drop out earlier. These two findings, taken together, are significant. If programs are structured to be women-sensitive (i.e., have highly trained, multicultural, women staff; be structured to admit women and their children; and provide safe, nonthreatening environments) women with dual diagnoses other than severe mental illness will stay in treatment long enough to obtain benefits. While some studies (Root 1989) have shown early drop-out and poor outcomes for women diagnosed with borderline personality disorder and/or posttraumatic stress disorder (PTSD), the present study appears to indicate that these women will stay in recovery if the program has been designed to meet their unique needs. It is possible that for these women, the controlled structure of the therapeutic community and the emphasis on "safety first" outweigh the sometimes overwhelming nature of entering such a new type of environment.

For women diagnosed with severe mental illness, the transition required in entering such a program may be too great. These women may be more easily overwhelmed by major changes such as immediately participating with others in "a community," changing behaviors, complying with program rules and procedures, etc. For such women, it is extremely important to design better "treatment preparedness" strategies. These treatment preparedness strategies include treatment readiness groups, visits to the program prior to intake and admission, outreach workers and/or treatment advocates accompanying the woman for preadmission visits and intake, time to speak with residents of the program prior to intake, and stabilization of medications (if necessary) prior to admission.

As has been shown in many studies, longer retention is associated with positive outcomes. A woman retained in treatment for more than 180 days is not only more likely to be perceived as doing better than a woman in treatment for less than 180 days, but is almost six times as likely to be clean and sober and almost five times as likely to have plans to get a job or go to school. With regard to women diagnosed with severe mental illness, women who remain in treatment less than 180 days are more likely to leave treatment against advice, to be perceived by staff to have disorganized thoughts, and to have no specific plans at the time of program departure.

It has been shown in this study that women with diagnoses of severe mental illness who do stay in treatment have outcomes similar to other women. As women progress at an individual rate in recovery, they learn how to participate in the program. Once women diagnosed with severe mental illness "learn" the program, they stay longer to receive its benefits. In addition, women diagnosed with

severe mental illness frequently have impoverished social support systems. The therapeutic community offers the women a new supportive group of women who understand many of their problems and issues. If the women can be assisted to remain in treatment, even when they are feeling uncomfortable, they will be able to participate in social skills training and thereby learn communication strategies and relationship building (Harris 1994). These skills not only will assist them in realizing the benefits of support in the treatment program, but will also help them enhance their social networks when they leave the program.

This study shows that women with diagnoses of severe mental illness and substance abuse can be engaged in a comprehensive, well-structured residential treatment program. For those women for whom such comprehensive and tailored services can be delivered, one finds strong post-treatment outcomes: sobriety, employment, and finding a safe place to live. These outcomes need not be worse than

those for women without severe mental illness. Consequently, the design of a comprehensive treatment model should include special services for women with severe mental illness that engage them early in care and focus on treatment preparedness so as to maximize the likelihood of retention in services, and subsequent positive treatment outcomes. In this comprehensive treatment model, heightened positive outcomes are a direct consequence of time in services. Prior results, in which women with severe mental illness have not demonstrated positive outcomes, may be due to the fact that they have not been retained sufficiently in treatment. In addition, an intensive, sensitive, and supportive treatment environment is needed to fully engage the women in care. Future work should extend this model to men with severe mental illness to examine the effects of participation in a highly enriched, comprehensive treatment model.

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