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Health, mental health, substance use, and service utilization among rural and urban incarcerated women

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Abstract

Incarcerated women commonly report health, mental health, and substance use problems, yet there is limited research on service utilization before incarceration, particularly among women from urban and rural areas. This study includes a stratified random sample of 100 rural and urban incarcerated women to profile the health, mental health, substance use, and service utilization, to examine the relationship between the number of self-reported problems and service utilization, and to examine self-reported health and mental health problems in prison as associated with pre-incarceration health-related problems and community service utilization. Study findings suggest that health and mental health problems and substance use do not differ significantly among rural and urban women prisoners. However, there are differences in service utilization – particularly behavioral health services including mental health and substance abuse services with urban women reporting more service utilization. In addition, rural women who reported using needed community services before prison also reported fewer health problems in prison. Implications for correctional and community treatment opportunities in rural and urban areas are discussed.

Keywords

health; mental health; substance use; service utilization

Women involved in the criminal justice system report more health problems than other women (Bloom, Owen, & Covington, 2005). For example, female inmates are three times more likely to report poor health than women in the general population (Marquart, 1999). One of the first publications to include data on self-reported health problems indicated that more than three-quarters of incarcerated women reported female reproductive health

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problems such as menstrual difficulties (Ingram-Fogel, 1991). Studies involving incarcerated women have identified a variety of health problems including sexually transmitted diseases, pregnancy and gynecological problems, fatigue, backaches, obesity, dental problems, mental health issues, kidney infections, and chronic health problems such as hepatitis, HIV, hypertension, emphysema, and asthma (Marquart, 1999; Ross & Lawrence, 1998; Young, 1998). While these studies suggest that health problems are common among incarcerated women in general, the literature is limited in examining prevalence and type of health problems among different subgroups of incarcerated women, such as women from urban and rural areas.

In addition to physical health, mental health problems such as depression and anxiety are common among incarcerated women (i.e., Peters, Strozier, Murrin, & Kearns, 1997; Ross & Lawrence, 1998; Sacks, 2004; Singer, Bussey, Song, & Lunghofer, 1995). One study reported that 64% of incarcerated women had been previously diagnosed with a psychiatric disorder (Jordan, Schlenger, Fairbank, & Caddell, 1996). Commonly identified psychiatric diagnoses include major depression, bipolar disorder, antisocial personality disorder, and PTSD (Birecree, Bloom, Leverette, & Williams, 1994; Ross & Lawrence, 1998; Zlotnick, 1997). Women prisoners often present characteristics associated with increased suicide risk (Leibling, 1994). A high percentage of incarcerated women also report a history of physical or sexual victimization which may potentially have a strong influence on mental and/or physical health (Young, 1998). Recognizing that these problems are consistently identified among this population, there is limited data to understand how mental issues differ for incarcerated women from rural and urban areas.

One of the most noted factors among incarcerated women is substance use, which contributes to and complicates health and mental health treatment. The Bureau of Justice Statistics (BJS) reports that approximately half of all female inmates were under the influence of alcohol or drugs at the time of their offense (BJS, 2000). In fact, in an earlier BJS survey of male and female offenders, a higher percentage of female offenders reported drug use (including ever used, using regularly, and using at the time of the offense) compared to male offenders (BJS, 2000). In this survey, 1 of 3 female offenders self-reported committing a crime to obtain drugs or money to buy drugs that lead to their incarceration. In addition, drugs and alcohol have been linked to health problems. For example, Anderson, Rosay, and Saum (2002) reported that the length of a drug using career increased the likelihood of mental health issues, HIV/STDs, and chronic illnesses reported among a sample of female offenders. While research has shown that substance use differs among rural and urban male offenders, especially with type of substances used (Leukefeld, et al., 2002a), studies focusing on substance use among female offenders across different geographic regions have not been conducted.

Services targeting health, mental health, and substance use problems among incarcerated women are often accessed for the first time in prison. Limited service utilization in the community among substance using female offenders is associated with economical disadvantages, inadequate housing, dependent children, and limited access to community health care (Ingram-Fogel, 1991; Ross & Lawrence, 1998). When access to community care, particularly preventative health care, is limited, women typically use emergency rooms for health care services when in the community. For example, in one study of incarcerated substance users, female participants reported an average of 13.7 lifetime emergency room visits (Staton, Leukefeld, & Webster, 2003). Coupling the lack of community preventative care with utilization of emergency rooms as primary care sources, the number of health and mental health problems requiring treatment in prison can be increased. For example, one study reported that female offenders made an average of 12.5 visits to prison “sick call” during the first six months of incarceration (Ingram-Fogel, 1991). Young (1998) reported

that during a four month period, a sample of 129 women used a surprisingly high 2,869 specific prison-based health services, which is substantially higher than women in the general population.

Although incarcerated women commonly report health, mental health, and substance use problems, the research literature is limited on women's service utilization before incarceration, particularly in different geographical areas. The literature review for this study did not identify any studies which have targeted differences between rural and urban women in health problems and community service utilization, which would be expected to be less available in rural areas. The majority of research on rural offenders includes males and focuses on substance use and criminality (i.e., Goodrum, et al., 2004; Leukefeld, et al., 2002a; Logan et al., 2001; Warner et al., 2001). It is important to examine potential differences in health, mental health, and substance use problems and service utilization among rural and urban female offenders in order to better understand treatment needs at prison entry.

This study has three primary objectives: (1) To profile the health, mental health, substance use, and service utilization among rural and urban incarcerated women. Based on studies which describe poor health for incarcerated women in general, it is expected that rural and urban women will not report significant differences in problems experienced. However, it is expected that urban women will report significantly more service utilization due to increased availability of services in urban areas. (2) To examine the relationship between the number of self-reported problems and service utilization among urban and rural incarcerated women. It is expected that there will be a stronger positive relationship between problems experienced and service utilization among urban women compared to rural women (3) To examine self-reported health and mental health problems in prison as associated with pre-incarceration health-related problems and service utilization. It is expected that pre-incarceration health problems will be associated with current incarceration problems, but this relationship will differ by community service utilization and by urban or rural geographic setting.

Method

Participants

This study included a stratified random sample of 100 women from the Kentucky Correctional Institution for Women (KCIW) who were interviewed between February and April 2003. At the time of data collection, KCIW was the state's only prison for women with a total population of 702 maximum, medium and minimum security female inmates. This study sample closely resembled the overall female inmate population with an average age of 37.4 and with the majority of participants (71%) being white. Since a disproportionate percentage of the general population reported an urban county of conviction (34%), the sample was stratified to obtain an equal representation of urban and rural participants.

Procedures

As part of a larger research project designed to study health service utilization among incarcerated substance users funded by the National Institute on Drug Abuse (RO1-11309, Leukefeld, PI), a different sample of women was recruited for this study. This study was approved by a full review of the University of Kentucky Medical Institutional Review Board (IRB) in January, 2003.

Study recruitment began with a list of all inmates obtained from the institution. Due to limited data on county of residence, inmates were partitioned into rural and urban groups based on their county of conviction using the 2000 U.S. census definitions. Rural counties

were defined as a county with a population of less than 50,000. The census definition of an urban area was 1,000 people per square mile which together have a population of 50,000. Using this definition, Kentucky had only one urban county. Therefore, the definition was modified to include a general population density of at least 900 people per square mile of land area and that have a population of at least 50,000 people within the county. Using the modified definition, three counties in Kentucky were categorized as urban. The sampling frame included 271 rural women and 265 urban women, a total of 536 incarcerated women. The remaining 166 women at the time of the study were convicted in suburban counties that did not fit the “rural” or “urban” definitions, and they were not included in the sampling frame. Within the sampling frame, 80 rural and 80 urban women were randomly selected. In order to reach the targeted goal of 100 participants, potential subjects were over sampled in each category to allow for individuals who were not interested in participating, women who were transferred before recruitment, or women who may not be available due to court, school, or other reasons.

Between February 12, 2003 and April 8, 2003, potential participants were sent recruitment letters asking them to attend study information sessions. These sessions were scheduled with blocks of 25 women to enable personal communication, to create an atmosphere for participants to ask questions about the study, and to monitor recruitment. Among the potential participants, 42 were transferred from the institution before the study informational session, six inmates were in segregation at the time of the interview, and four inmates attended the session but indicated that they were not interested in the study. Seven inmates were passive refusals because they had scheduling conflicts or did not come to their appointment time. The final sample was 100 female inmates which included 51 rural women and 49 urban women.

All project interviewers were female, and they were trained in the study protocol as well as prison policies and procedures. A team of five interviewers visited the prison on five different days to collect data. The institution's visitation room was large enough for interviewers to position themselves in different areas in order to provide a confidential face-to-face interview. While correctional officers monitored visitation room entry and exit, officers were not present for the confidential interviews. After informed consent, participants responded to interview questions which focused on health, mental health, substance use, and service utilization. Interviews lasted about one hour, and participants were paid \$25.

Measures

Health problems—Health problems were assessed using a modified version of the Miami Health Services Questionnaire (Chitwood et al., 1999) which has been used in other studies examining health service utilization among incarcerated substance users (Leukefeld, et al., 2002b; Staton, Leukefeld, & Webster, 2003). As shown in Table 1, participants were asked if they had experienced a number of health problems, and participants were given examples to operationalize the problem (both lifetime and during prison): 1) Female problems, 2) Respiratory problems, 3) Trauma/Physical injury, 4) Muscle/Bone problems, 5) Liver problems, 6) Circulatory problems, 7) Stomach/Digestive problems, 8) Nervous System problems, 9) Skin problems, 10) Eye, ear, nose or throat problems, 11) Sexually transmitted diseases, 12) Dental problems, 13) Nervous or mental health problems, and 14) Problems associated with being pregnant. Each of these health variables were coded dichotomously (0=no, 1=yes), and then they were summed for an overall index of health symptoms ranging from 0 - 14 (lifetime and during prison).

Mental health problems—The mental health variables were selected from the psychological section of the Addiction Severity Index (ASI) (McLellan, Luborsky, Woody, & O'Brien, 1980). The ASI was developed for use primarily with clinical populations, but has been found to have wide utility as a research assessment tool among substance users and has shown reliability and validity in measuring psychosocial functioning (McLellan et al., 1980; McLellan et al., 1985). Specific mental health questions included pre-incarceration and during incarceration reports of ever experiencing depression, anxiety, hallucinations, cognitive impairment (trouble understanding, concentrating, or remembering), trouble controlling violent behavior, serious thoughts of suicide, and suicide attempts. Each of these mental health measures were coded dichotomously (0=no, 1=yes), and then they were summed for an overall index of mental health symptoms ranging from 0 - 7. In addition, participants were asked whether they have ever (lifetime and year prior to incarceration) experienced emotional, physical, and/or sexual abuse (coded as 0=no, 1=yes).

Substance use—Substance use was assessed using modified versions of the alcohol and drug sections of the ASI. Specifically, participants indicated whether they used the following substances in their lifetimes and during the year prior to their incarceration: alcohol, marijuana, cocaine, crack, sedatives, amphetamines, methamphetamines, and opiates. In addition, participants were asked if they ever used more than one substance in the same day during this year. Each of these responses were dichotomously coded (0=no, 1=yes). Participants were also asked a general question about the number of days of any drug use and the number of days of alcohol use during the year before prison and the average number of years of regular illicit substance use (regular defined as 3 times a week for more for a period of at least one month).

Service utilization—Service utilization included questions from both the Miami Health Services Questionnaire and the Addiction Severity Index measuring self-reported lifetime use of health and behavioral health services. Specifically, participants were asked about *health service utilization* which included the number of times seen by a doctor as an outpatient or private patient (lifetime), the number of times seen in ER (lifetime), the number of times admitted to a hospital (not through an ER), and the total nights spent in hospital (lifetime). Participants were also asked perception questions about how long it took them to travel to their place of regular health care (coded in minutes), whether they felt they had access to the services they needed prior to prison (yes/no), and whether they used services as they needed them prior to incarceration (yes/no). *Behavioral health service utilization* included the number of times a woman was treated as an outpatient or private patient (lifetime) and number of times treated in a hospital (lifetime) for mental health problems. Participants were also asked whether they had ever received treatment for alcohol or drug abuse (yes/no), and the number of times they were in treatment (lifetime).

Analytic plan—To meet the first study objective, a series of chi-squares and t-tests were used to examine differences between rural and urban women across dependent measures of health, mental health, substance abuse, and service utilization. To meet the second study objective, correlation analyses were conducted to determine the bivariate relationships between the number of problems identified and the number of service utilization episodes for rural and urban women. To meet the third study objective, analysis of variance (ANOVA) was used to examine the main effects and interactions of pre-incarceration problems, needed service utilization before incarceration, and rural/urban county of conviction on self-reported health and mental health problems reported while in prison.

Results

Demographics

Few differences were noted for demographic characteristics between rural and urban women (See Table 2). A higher percentage of rural women were white (84.3%) compared to urban women (59.2%) ($\chi^2 = 7.8, p < .01$). In addition, rural women were less likely to be single and never married (25.5%) than urban women (49.0%) ($\chi^2 = 5.9, p < .05$). There were marginal differences ($p < .10$) in current offenses with more rural women reporting serving time for drug charges (33.3%) compared to urban women (18.4%); while a higher percentage of urban women reported currently serving time for a property crime (42.9%) compared to rural women (25.5%). No significant differences emerged for age, years of education, or average weekly income.

Health problems

There were few differences between rural and urban women in self-reported lifetime health problems (See Table 3). One exception was that a lower percentage of rural women reported ever experiencing a sexually transmitted disease (7.8%) compared to urban women (26.5%) ($\chi^2 = 6.2, p < .05$). No significant differences emerged in self-reports of other health problems. In addition, a summative index of the total number of lifetime health problems did not differ between rural and urban women. For in-prison health problems, only one health problem differed significantly between groups with a lower percentage of rural women reporting muscle and bone problems (43.0%) than urban women (63.3%) ($\chi^2 = 4.1, p < .05$).

Mental health problems

As shown in Table 4, there were no significant differences between rural and urban women on any of the mental health measures, which included both symptoms of mental health issues as well as self-reported histories of emotional, physical, or sexual abuse.

Substance use

As shown in Table 5, few differences emerged between rural and urban women in their self-reported lifetime substance use. A significantly higher percentage of urban women reported ever using crack (61.2%) compared to rural women (39.2%) ($\chi^2 = 4.8, p < .05$). In addition, a significantly higher percentage of urban women reported crack use during the year before incarceration (49.0%) compared to rural women (27.5%) ($\chi^2 = 4.9, p < .05$). No significant differences were found between the groups for lifetime use of any other substance, substance use during the year before incarceration, the average number of years of regular substance use, or the number of days reporting either drug or alcohol use in the year before prison.

Service utilization

Findings for service utilization are presented in Table 6. The only significant difference for health service utilization was that rural women reported a higher number of hospital admissions other than the emergency room ($M = 3.8, SD = 4.7$) than urban women ($M = 2.2, SD = 2.3$) ($F(1, 96) = 9.1, p < .01$). No other differences emerged between rural and urban women on health services utilization. There were also no differences in perceived access to healthcare or use of services as needed before prison. There was a marginal difference ($p < .10$) in distance traveled to the regular place of health care with rural women reporting an average travel time of 21.7 minutes compared to 16.6 minutes for urban women.

A significant difference did emerge between rural and urban women in their use of mental health services with rural women reporting fewer lifetime hospitalizations for mental health

problems ($M = 0.6$, $SD = 1.6$) than urban women ($M = 1.8$, $SD = 3.4$) ($F(1, 97) = 11.5$, $p < .01$). However, there were no significant differences between groups in the number of outpatient visits for mental health problems, or in mental health service utilization during the year prior to incarceration.

Differences between rural and urban women were also found for self-reported substance abuse treatment episodes, with fewer rural women reporting ever receiving drug abuse treatment (38.0%) compared to urban women (64.6%) ($\chi^2 = 6.9$, $p < .01$). Among those who did receive drug treatment, rural women reported significantly fewer treatment episodes ($M = 1.0$, $SD = 2.3$) than urban women ($M = 3.8$, $SD = 7.5$) ($F(1, 96) = 10.3$, $p < .01$). No differences were found for the percentage of women who reported ever receiving alcohol treatment or the number of alcohol treatment episodes.

Correlations between problems and service utilization

To examine the relationship between self-reported problems and service utilization among rural and urban women, correlations were computed separately for rural and urban women. For urban women, the number of lifetime health problems was positively associated with the number of lifetime emergency room visits ($r = .404$, $p < .01$). There was also a positive and significant relationship between lifetime mental health problems and psychological treatment in a hospital ($r = .461$, $p < .01$) and as an outpatient ($r = .357$, $p < .05$). However, there was no significant relationship between the number of years of regular drug use and the number of times in either alcohol or drug treatment for urban women.

For rural women, there were no significant differences between the total number of self-reported health problems and the use of health services. However, there was a significant and positive relationship between lifetime mental health problems and the number of psychological treatment episodes in a hospital ($r = .345$, $p < .05$) as well as an outpatient ($r = .321$, $p < .05$). In addition, different from the patterns for urban women, there was a significant positive correlation between the years of regular substance use and the number alcohol ($r = .470$, $p < .01$) and drug treatment episodes ($r = .543$, $p < .01$).

In-prison health and mental health

Two 3-way ANOVAs assessed the main effects and interactions of the number of lifetime health and mental health problems, self-reported needed service utilization before incarceration, and urban/rural county of conviction were examined on self-reported health and mental health problems while in prison. Main effects were assessed first, followed by possible 2-way and 3-way interactions. Summative indices of lifetime health and mental problems were used to develop two groups characterized by either more or less lifetime health and mental health problems using a median split. For both models, race/ethnicity was included as a covariate since this variable differed significantly by urban and rural women. However, race/ethnicity did not emerge as significant.

Significant results were found for in-prison physical health problems but not for mental health. A main effect of lifetime health problems ($F(1, 88) = 7.72$, $p < .05$) indicates that women who had more problems before prison also reported more health problems while incarcerated. There were no significant main effects for in-prison health problems as a function of needed service utilization before incarceration or urban/rural county of conviction. However, a significant “urban/rural county of conviction” by “needed service utilization” interaction was found ($F(1, 88) = 1.12$, $p < .05$). Specifically, for urban women, needed service utilization before prison did not significantly influence the number of physical health problems experienced during prison ($M = 3.7$, $SD = 0.25$) when compared to women who reported not using needed services ($M = 2.7$, $SD = 0.54$). However, for rural

women, needed service utilization before prison led to significantly fewer reported problems while in prison ($M = 2.9$, $SD = 0.24$) than for women who reported not using needed services ($M = 4.2$, $SD = 0.50$). No other interactions were significant.

Discussion

The literature consistently reports that frequent health, mental health, and substance use problems are common among women prisoners (i.e., Anderson, Rosay, & Saum, 2002; Staton, Leukefeld, & Webster, 2003; Young, 1998), yet there has been limited research on service utilization before incarceration, particularly among groups of incarcerated women from different geographic areas. This study profiled the health, mental health, substance use, and service utilization of incarcerated urban and rural women. It was expected that rural and urban women would not self-report significant differences in problems, but that urban women would report significantly higher health service utilization. This hypothesis was supported since there were few differences between rural and urban women on health problems and mental health problems. The one exception was that a higher percentage of urban women reported ever experiencing an STD. In general, this finding is supported by other studies which suggest that STD rates are higher among women prisoners than the general population (Hammett & Harmon, 1999). However, it is unclear why women from *urban areas* report higher rates of STDs. It is possible that urban women engage in riskier sexual behaviors. It is also possible that public health services needed to identify STDs are more available and accessible to urban women. Another factor may be that risky sexual behavior and STDs are more stigmatized in rural areas, so women from rural areas may be more likely to under-report STDs.

Another potential factor influencing increased rates of STDs among urban women is crack use since a higher percentage of urban women reported using crack cocaine compared to rural women. This finding is consistent with other studies which suggest that crack is more widely available and used in urban areas (O'Malley, Johnston, & Bachman, 1991). It is also possible that crack use and STDs are more common among urban women (Inciardi, 1995; McCoy & Miles, 1992; Ross, Hwang, Leonard, Teng, & Duncan, 1997). There is limited research focusing on rural women, crack use, and STDs to clarify this finding, but this is an important area for future research.

The use of behavioral health services varied among rural and urban women. However, counter to the hypothesis, rural women reported more hospital admissions than urban women. This finding was not expected because hospital services should be more available and accessible in urban areas. It was also interesting to note that there was only a marginal difference in the perceived travel time to regular health care services. This finding could suggest that the rural and urban definitions used in this study may include women in rural counties that are also close to urban areas, or women from urban counties who live in city areas which are not geographically close to available health care. Regardless of perceived service availability, a high percentage of women in both groups indicated that they had access to the healthcare they needed and that they used services as needed before prison.

Differences were found between urban and rural women on behavioral health service utilization. Specifically, rural women reported fewer lifetime hospitalizations for mental health issues than urban women. Since there were no differences between these groups on self-reported mental health problems, this finding may suggest that treatment for serious mental health issues that warrant hospitalization are more available in urban areas. In addition, fewer rural women reported ever receiving drug treatment compared to urban women. This finding was consistent with the hypothesis and consistent with other data which suggests that drug treatment in Kentucky is limited in rural areas, particularly for women.

(Kentucky Needs Assessment Project, 1999). With the exception of crack cocaine use, there were no differences between rural and urban women in their self-reported substance use or in use patterns during the year before incarceration. This finding suggests that while rural and urban women reported similar substance use patterns, treatment utilization differed by geographic area. Further research is needed to examine treatment opportunities in rural areas in order to understand if treatment utilization is related to availability or to other factors which may discourage treatment entry.

In order to better understand service utilization, the relationship between the number of problems reported and community service utilization was examined. It was expected that there would be a stronger positive relationship between problems experienced and service utilization among urban women compared to rural women. This hypothesis was supported for physical health service utilization, but not for behavioral health service utilization. Specifically, there was a positive relationship between lifetime health problems and the number of emergency room visits for urban women but not for rural women. However, trends suggesting a positive relationship between the number of mental health problems and mental health service utilization were similar for urban and rural women for both psychological treatment in a hospital and outpatient treatment. Even more surprising was the finding that more years of regular substance use was positively and strongly associated with the number of both alcohol and drug treatment episodes for rural women, but not for urban women.

The substance abuse treatment finding was particularly interesting and not expected given the previously noted differences in treatment utilization between rural and urban women. In other words, while more urban women reported previous substance abuse treatment, there was a stronger relationship between regular lifetime substance use and drug treatment utilization among rural women. This finding suggests that rural women who have utilized substance use treatment may have a more serious substance abuse career compared to urban women. Reasons for entering treatment and the location of treatment were not available, but should be considered in future studies in order to examine if differences between rural and urban women are attributed to treatment need or to treatment availability.

This study examined pre-incarceration problems, perceived use of needed services before incarceration, and urban/rural county of conviction as factors associated with self-reported prison health and mental health problems. It was expected that pre-incarceration health problems would be associated with current incarceration health problems, but this relationship would be more strongly related to needed community service utilization for urban women than for rural women. These findings suggested that, overall, women with more health problems before prison also reported more health problems during their current incarceration. This finding was expected since another study of prisoners transitioning to the community showed that one of the best predictors of current health problems is past health problems (Leukefeld, et al., in press). However, contrary to the hypothesis, the use of needed services before prison was not significantly related to the number of physical health problems experienced while in prison by urban women. However, for rural women, needed service utilization before prison led to significantly fewer reported health problems while in prison. Despite the few differences between groups in self-reported health problems, these findings may suggest that rural women were more likely to seek services for health problems when they were most needed, which was associated with reduced problems in prison. This finding needs to be more closely examined in future studies in order to better understand why rural and urban women use health services, for what particular problems, and which types of services are most effective in reducing future health problems.

This study has limitations. It is possible that the few differences between rural and urban women are related to the classification of women as “rural” from counties with fewer than 50,000 people. In addition, the limited number of urban counties in Kentucky also limits generalizability since the urban women were localized in three counties. This study is also limited by the cross-sectional design. The measures of health problems, although detailed in examples to operationalize, are based on the person's perception of their experience with those problems, and do not include verification based on medical records. The complexities of health and mental health problems, substance use, and service utilization may be better examined longitudinally rather than retrospectively in order to allow for more accurate reporting of health problems over time, as well as interactions with the health care system.

The small sample size also may have limited power to detect small or moderate differences between the groups. However, it should also be noted that the fact that differences were observed across the study groups suggests that there is increased probability that those same trends would be observed in a larger sample. In addition, the fact that this type of study has not been conducted with rural and urban women in a randomly selected population supports the significance of these descriptive findings which have implications for future research. The sample size also limited more complex statistical analysis to control for potential variance in dependent measures attributed to marital status or race. The sample was randomly selected, and noted differences in race and marital status in the sample likely reflect demographic differences among rural and urban women in Kentucky (i.e., higher percentage of white individuals in rural areas).

Despite these limitations, findings from this study contribute to the research literature on health and mental health problems, substance use, and service utilization among incarcerated women from different geographic areas. These study findings should be replicated in larger controlled trials, and should corroborate self-reported health problems with data from medical records. Future research should attempt to better understand the association between health problems and service utilization among rural and urban women, particularly given the differences in the relationship between problems and service use among these groups. Of particular interest is the finding that health problems differed little between rural and urban women, yet access to services is greater in urban areas, suggesting that access to care may have little influence on problems among rural women. This finding has important implications for correctional treatment providers since many women, especially substance abusing women, seek treatment for health and mental health problems for the first time in prison which increases costs to the criminal justice system. To this point, it is also important for future research to examine changes in service utilization patterns from community to prison to better understand the costs associated with providing primary care in correctional facilities. Future research should also focus on better understanding service utilization among women in rural and urban areas and how service utilization is related to access, service availability, and treatment need, as well as cultural and/or economic factors. Overall, an increase in health, mental health, and substance use treatment opportunities which are targeted and tailored to women in both rural and urban areas could reduce correctional treatment costs, and perhaps improve outcomes for women as they transition from prison to the community.

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References

- Anderson TL, Rosay AB, Saum C. The impact of drug use and crime involvement on health problems among female drug offenders. *The Prison Journal*. 2002; 82(1):50–69.
- Birecree EA, Bloom JD, Leverette MD, Williams M. Diagnostic efforts regarding women in Oregon's prison system: a preliminary report. *International Journal of Offender Therapy and Comparative Criminology*. 1994; 38(3):217–230.
- Bloom B, Owen B, Covington S. A summary of research, practice, and guiding principles for women offenders. US Department of Justice: National Institute of Corrections (#020418). 2005
- BJS. Bureau of Justice Statistics. Women Offenders. Washington, DC: Bureau of Justice Statistics. L. Greenfield & T. Snell; 2000.
- Chitwood DD, McBride DC, French MT, Comerford M. Health care need and utilization: A preliminary comparison of injection drug users, other illicit drug users, and non-users. *Substance Use and Misuse*. 1999; 3(4&5):727–746. [PubMed: 10210102]
- Goodrum S, Staton M, Leukefeld C, Webster JM, Purvis R. Perceptions of a prison-based substance abuse treatment program among staff and participants. *Journal of Offender Rehabilitation*. 2002; 37(3/4):27–46.
- Hammett, TM.; Harmon, P. 1996-1997 Update: HIV/AIDS, STDs, and TB in correctional facilities. National Institute of Justice, NCJ 157642. Washington, DC: U. S. Department of Justice; 1999.
- Sexually transmitted diseases and hepatitis: Burden of disease among inmates.
- Inciardi JA. Crack, crack house sex, and HIV risk. *Archives of Sexual Behavior*. 1995; 24(3):249–269. [PubMed: 7611845]
- Ingram-Fogel C. Health problems and needs of incarcerated women. *Journal of Prison & Jail Health*. 1991; 10(1):43–57.
- Jordan BK, Schlenger WE, Fairbank JA, Caddell JM. Prevalence of psychiatric disorders among incarcerated women. *Archives of General Psychiatry*. 1996; 53:513–519. [PubMed: 8639034]
- Center on Drug and Alcohol Research, University of Kentucky; Lexington, KY: 1999. Kentucky Needs Assessment Project – KNAP. <http://cdar.uky.edu/knap/AdultSurveys/index.html>
- Liebling A. Suicide amongst women prisoners. *The Howard Journal*. 1994; 33(1):1–9.
- Leukefeld CG, Narevic E, Hiller ML, Staton M, Gillespie W, Webster JM, Garrity T, Purvis R. Alcohol and drug use among rural and urban incarcerated substance abusers. *International Journal of Offender Therapy & Comparative Criminology*. 2002a; 46(6):715–728. [PubMed: 12491847]
- Leukefeld CG, Staton M, Hiller ML, Logan TK, Warner B, Shaw K, Purvis RT. A descriptive profile of health problems, health service utilization, and HIV serostatus among incarcerated male drug abusers. *The Journal of Behavioral Health Services & Research*. 2002b; 29(2):167–175.
- Leukefeld CG, Hiller ML, Webster JM, Staton Tindall M, Martin SS, Duvall J, Tolbert VE, Garrity TF. A prospective examination of high-cost health services utilization among drug using prisoners re-entering the community. *Journal of Behavioral Health Services & Research*. in press.
- Marquart JW, Brewer VE, Mullings JL. Health risk as an emerging field within the new penology. *Journal of Criminal Justice*. 1999; 27(2):143–154.
- McCoy HV, Miles C. A gender comparison of health status among users of crack cocaine. *Journal of Psychoactive Drugs*. 1992; 24(4):389–397. [PubMed: 1491288]
- McLellan A, Luborsky L, O'Brien C, Woody G. An improved diagnostic instrument for substance abuse patients: The Addiction Severity Index. *Journal of Nervous and Mental Diseases*. 1980; 168:26–33.
- McLellan AT, Luborsky L, Cacciola J, Griffith J, Evans F, Barr HL, O'Brein CP. New data from the Addiction Severity Index: Reliability and validity in three centers. *Journal of Nervous & Mental Disorders*. 1985; 173:412–423.
- O'Malley PM, Johnston LD, Bachman JG. Quantitative and qualitative changes in cocaine use among American high school seniors, college students, and young adults. NIDA Research Monograph. 1991; 110:19–43. [PubMed: 1944498]
- Peters RH, Strozier AL, Murrin MR, Kearns WD. Treatment of substance-abusing jail inmates. *Journal of Substance Abuse Treatment*. 1997; 14(4):339–349. [PubMed: 9368210]

- Ross, MW.; Hwang, L.; Leonard, L.; Teng, M.; Duncan, L. Crack cocaine as a major risk for HIV transmission in a crack house population. TCADA Research Briefs (On-Line). 1997. Available: www.tcada.state.tx.us/reserch/crackaids.html
- Ross PH, Lawrence JE. Health care for women offenders. *Corrections Today*. 1998; 60(7):122–127.
- Sacks JY. Women with co-occurring substance use and mental disorders (COD) in the criminal justice system: A research review. *Behavioral Sciences & the Law*. 2004; 22(4):449–466. [PubMed: 15282834]
- Singer MI, Bussey J, Song LY, Lunghofer L. The psychosocial issues of women serving time in jail. *Social Work*. 1995; 40:103–113. [PubMed: 7863361]
- Staton M, Leukefeld C, Webster JM. Substance use, health, and mental health: Problems and service utilization among incarcerated women. *International Journal of Offender Therapy and Comparative Criminology*. 2003; 47(2):224–239. [PubMed: 12710367]
- Warner B, Leukefeld CG. Rural-urban differences in substance use and treatment utilization among prisoners. *American Journal of Drug and Alcohol Abuse*. 2001; 27(2):265–280. [PubMed: 11417939]
- Zlotnick C. Posttraumatic stress disorder (PTSD), PTSD comorbidity, and childhood abuse among incarcerated women. *The Journal of Nervous and Mental Health Disease*. 1997; 185(12):761–763.

Figure 1.
Lifetime health problems, use of services as needed prior to incarceration, and county of conviction.

Table 1
Measures of health problems

Respiratory system or breathing problems such as TB, bronchitis, pneumonia, emphysema, asthma, hay fever, shortness of breath, or wheezing?
A physical injury or accident such as broken bones, head injury, burns, concussion, gunshot or knife wounds, sports injuries, or sexual assault?
Muscle or bone problems such as arthritis, carpal tunnel syndrome, constant back pain, paralysis, neck stiffness, permanent stiffness, or foot problems?
Liver related problems such as hepatitis, jaundice, cirrhosis, or diabetes?
Heart, blood, or circulatory problems such as high or low blood pressure, endocarditis, irregular heart beat, angina, heart attack, murmurs, stroke, blood disease, or tingling or numbness in the hands or feet?
Stomach or digestive problems such as ulcers, colitis, nausea, vomiting, persistent diarrhea, stomach pain, or irritable bowel syndrome?
Nervous system problems such as migraine headaches, epilepsy, seizures?
Skin problems such as abscesses, cellulitis, skin ulcers, skin cancer, rashes, dermatitis, or infections?
Eye, ear, nose, or throat problems such as persistent sore throat, ear infections, eye infections, deviated septum, or major changes in vision (glaucoma, cataracts)?
Dental problems such as cavities, infected teeth, or gum disease
Nervous or emotional problems such as nerves, stress, anxiety, depression, manic depression?
A sexually transmitted disease such as syphilis, gonorrhea, NGU, chlamydia, herpes, genital warts, (HPV), or any STD other than HIV/AIDS?
Pregnancy related problems , childbirth, and pregnancy problems such as bleeding, miscarriage, pain?
Female problems other than pregnancy, such as menstrual period problems, breast or cervical cancer, cysts, yeast infections, painful urination, bladder infections, missing periods, painful intercourse, rectal bleeding due to trauma, vaginal bleeding or discharge other than a period, pelvic inflammatory disease (PID), vaginal or urinary tract infections (UTI)?

Table 2
Demographics of rural and urban incarcerated women

	Rural (n=51)	Urban (n=49)
Age	36.4	38.1
% White **	84.3%	59.2%
% Single, never married *	25.5%	49.0%
Years of education	11.4	11.6
Average weekly income during year before prison	\$267.37	\$318.12
Current charges		
Violent	45.1%	40.8%
Drug-related †	33.3%	18.4%
Weapons offense	6.0%	0%
Property offense †	25.5%	42.9%

Note:

**
p<.01,

*
p<.05,

†
p<.10

Table 3
Percent reporting lifetime health problems and health problems during incarceration by rural and urban women

	Lifetime		During Incarceration	
	Rural (N=51)	Urban (N=49)	Rural (N=51)	Urban (N=49)
Respiratory system problems	56.9	51.0	43.1	34.7
A physical injury or accident	76.5	69.4	16.0	22.4
Muscle or bone problems	68.6	67.3	43.1	63.3
Liver related problems [†]	15.7	30.6	7.8	18.8
Heart, blood, or circulatory problems	39.2	30.6	27.5	25.0
Stomach or digestive problems	45.1	42.9	29.4	34.7
Nervous system problems	52.9	47.9	41.7	36.2
Skin problems [†]	9.8	22.4	6.1	18.4
Eye, ear, nose, or throat problems	37.3	32.7	25.5	25.0
Dental problems	64.0	63.3	38.8	49.0
Nervous or emotional problems	76.5	72.9	64.0	60.4
Sexually transmitted disease [*]	7.8	26.5	0	6.1
Pregnancy related problems,	43.1	51.0	3.9	0
Female problems	54.9	55.1	23.5	34.7

Note:

^{*} p<0.05;

[†] p<.10

Table 4
Percent reporting lifetime mental health symptoms and problems experienced during incarceration by rural and urban women

	Lifetime		During Incarceration	
	Rural (N=51)	Urban (N=49)	Rural (n=51)	Urban (n=49)
Depression	66.7	63.3	49.0	51.0
Anxiety	51.0	49.0	43.1	38.8
Hallucinations	15.7	12.2	9.8	10.2
Cognitive impairment	33.3	38.8	29.4	28.6
Trouble controlling violent behavior	33.3	34.7	9.8	20.4
Serious thoughts of suicide	29.4	36.7	9.8	6.1
Attempted suicide	35.3	36.7	3.9	2.0
Ever been emotionally abused?	76.5	79.6		
Ever been physically abused?	70.6	71.4		
Ever been sexually abused?	52.9	46.9		

Table 5
Drug use among rural and urban incarcerated women

	Lifetime		Year Before Incarceration	
	Rural (N=51)	Urban (N=49)	Rural (n=51)	Urban (n=49)
Alcohol	88.2	91.8	68.6	69.4
Marijuana	78.4	77.6	37.3	49.0
Cocaine	60.8	67.3	25.5	36.7
Crack *	39.2	61.2	27.5	49.0
Sedatives	52.9	51.0	33.3	32.7
Amphetamines	31.4	32.7	11.8	12.2
Methamphetamines	23.5	20.4	15.7	10.2
Opiates	31.4	32.7	21.6	16.3
More than one substance in same day	62.7	73.5	54.9	63.3

Note:

*
 p<.05

Table 6
Health services utilization among rural and urban incarcerated women

	Rural (n=51)	Urban (n=49)
Health Services		
Number of times seen in ER (lifetime) [†]	37.6	59.7
Number of times seen in ER (year before)	4.1	4.3
Number of times admitted to a hospital (not through an ER) **	3.8	2.2
Total nights spent in hospital (lifetime)	31.0	33.2
Average minutes traveled to place of regular health care [†]	21.7	16.6
Percent reporting that they felt they had access to the health care they needed when on the street	88.2%	87.8%
Percent reporting that they used services as they needed them prior to incarceration	80.4%	83.7%
Mental health Services		
Lifetime hospitalizations **	0.6	1.8
Year before prison hospitalization	0.1	0.1
Lifetime outpatient services	4.8	4.9
Year before prison outpatient services	2.3	2.5
Substance Abuse Treatment		
Ever received alcohol treatment	26.0	20.8
Ever received drug treatment **	38.0	64.6
Number of alcohol treatment episodes	0.7	1.3
Number of drug treatment episodes **	1.0	3.8

Note:

**
p<.01;

[†]
p<.10