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The living arrangement may differentially influence IDU parents' motivation to reduce HIV risk as a function of gender

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Studies that examine data from drug-abusing parents typically investigate the impact of parental behavior on their children's well-being and focus almost exclusively on the impact of mothers. Other approaches have examined the level of parental involvement among parents in drug treatment and find that a higher level of parental involvement is related to lower levels of addiction severity. Recent research examines the specific role of fathers and suggests that the promotion of responsible parenting may serve as a positive motivational influence among fathers participating in drug treatment. The present study investigated the influence of the living arrangement on improvements in HIV-risk reduction variables among 151 IDU parents who participated in the Community-friendly Health Recovery Program intervention. A gender \times living arrangement interaction demonstrated greater enhancements in social and personal motivation to reduce HIV risk among fathers currently living with their children vs. fathers not living with their children while the opposite pattern of outcomes was demonstrated for mothers. Findings indicate that a parenting role that includes living with children may differentially influence parents' HIV-risk reduction motivation as a function of gender.

Keywords: HIV infection; HIV intervention; injection drug use; parents; drug treatment

Introduction

It is estimated that 36% of AIDS cases in the USA are associated with injection drug use and 16% of all newly diagnosed HIV infections in 2006 were injection drug use-related (Centers for Disease Control and Prevention [CDC], 2008). HIV vaccine trials have been disappointing and the development of an effective vaccine remains a distant hope that may never come to fruition (Kalichman, 2008). Behavioral interventions, thus, remain a primary tool for reducing the risk of HIV transmission (Semaan et al., 2002). Even when effective, however, behavioral interventions targeting injection drug users (IDUs) tend to produce relatively modest effect sizes (e.g., Copenhaver et al., 2006) and often require creative means to enhance motivation and skills to reduce HIV-risk behavior.

Prior research based on the Information–Motivation–Behavioral (IMB) skills model of behavior change (Fisher, Amico, Fisher & Harman, 2008; Fisher & Fisher, 1992; Fisher, Fisher, Amico & Harman, 2006) points to the relative importance of targeting participants' HIV-risk reduction motivation vs. employing the more common informational approaches (Copenhaver & Lee, 2006). The IMB model specifies that HIV-risk reduction information

and motivation work primarily through HIV-risk reduction behavioral skills to influence HIV preventive behavior. The effects of HIV-risk reduction information and motivation are expressed mainly through the use of risk reduction behavioral skills that are applied in the initiation and maintenance of HIV-risk reduction behavior. The model also specifies that HIV-risk reduction information and motivation may have direct effects on HIV-risk reduction behavior, particularly when complex or novel behavioral skills are not necessary to influence outcomes. For example, after enrolling in drug treatment, an individual may become motivated to establish or re-establish healthier roles with family members and to withdraw from relationships that have supported less healthy roles that include HIV-risk behavior. Accordingly, researchers have begun to systematically examine whether motivation stemming from family relationships may be harnessed for the purpose of bolstering drug treatment outcomes (McMahon & Rounsaville, 2002; McMahon, Winkel & Rounsaville, 2008; McMahon, Winkel, Suchman & Luthar, 2002; McMahon, Winkel, Suchman & Rounsaville, 2007).

While an abundance of studies have explored a range of issues surrounding mothers in drug treatment (Burnstein, Stanger, Kamon & Dumenci, 2006;

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Suchman, Rounsaville, DeCoste & Luthar, 2007), some recent studies have targeted fathers (McMahon et al., 2007) and suggest that focusing on their role as parents may, in itself, serve as a unique motivating factor in their drug treatment outcomes (McMahon & Rounsaville, 2002; McMahon et al., 2002). Indeed, prior research with fathers, in general, indicates that parenthood has the effect of increasing their engagement in a wide range of pro-social activities (e.g., Eggebeen & Knoester, 2001; Knoester & Eggebeen, 2006) and this effect is significantly more pronounced and durable when fathers reside with their children vs. when they live separately. Thus, fathering behavior that includes residing with children is thought to be important not only in terms of the children's developmental outcomes but also for the positive influence on their own lives (Knoester & Eggebeen, 2006). Perhaps due to the disparate roles typically assumed by male and female parents (e.g., Copenhaver, 1996; Craig, 2006), this particular type of bi-directional influence has not been observed among mothers.

The present study sought to investigate possible gender differences in the extent to which a parenting role that included living with their children was associated with IDU parents' sex- and drug-risk related outcomes following an HIV-risk reduction intervention. Based on prior research (Knoester & Eggebeen, 2006; Stewart, Gossop & Trakada, 2007), we hypothesized that fathers whose parenting role included living with their children would demonstrate relatively greater motivation to reduce HIV risk vs. those not living with their children while this patterns would not be demonstrated for mothers.

Materials and methods

Intervention

Based on the IMB model (Fisher & Fisher, 1992; Fisher et al., 2006, 2008), the Community-friendly Health Recovery Program (CHRP; Copenhaver, Lee & Margolin, 2007) is a theory-driven behavioral HIV-risk reduction intervention tailored for IDUs participating in drug treatment. It is manual-guided and comprised of four 50-minute group sessions that target sex- and drug-related HIV risks among IDUs. The sessions were co-facilitated by two trained bachelor's level counselors who delivered intervention content using cognitive remediation strategies designed to accommodate the mild to moderate cognitive difficulties that are common among IDUs in drug treatment (Copenhaver, Margolin, Avants & Warburton, 2003).

The intervention was inserted in a modular manner into 37 normally scheduled methadone maintenance treatment group meetings at the APT Foundation, Inc. in New Haven, CT. The APT Foundation clinics serve approximately 1385 patients, 39% of whom are female and 65% of whom can be classified as economically disadvantaged (i.e., receiving some type of entitlement such as Title 19, SAGA, or SSI/DI). Overall, these clinics serve 28% HIV positive, 15% status unknown, and 57% HIV-negative individuals.

Participants

A convenience sample of 226 methadone maintenance patients was participants in a larger intervention study (see Copenhaver et al., 2007). For the purposes of this analysis, we examined only data from the 154 participants who reported having one or more children. Among this group, three participants did not complete the study. The characteristics of the 151 remaining participants were as follows: IDUs (73%), male (40%), currently married (26%), unemployed (59%), English speaking (88%), and age range 19–58 years (mean age was 38.6 years). Participants were 62% Caucasian, 23% African American, 14% Latino, and 1% American Indian. Males were slightly older than females (age 41 vs. 38, respectively). Males and females reported having a similar number of children (2.5 vs. 2.7, respectively) although more females lived with their children vs. males (66% vs. 43%; $\chi^2 = 7.77$, $p = 0.005$). The study protocol was approved by the Investigational Review Board (IRB) at the University of Connecticut and by the research review board at the APT Foundation, Inc. and all participants signed an informed consent form prior to their participation.

Measures

Items from the Risk Assessment Battery (RAB; Metzger et al., 1993) were selected to assess participants' sex- and drug-related HIV-risk behavior (one item each for reported condom use and drug use, respectively). According to the IMB model (Fisher & Fisher, 1992; Fisher et al., 2006, 2008) on which our intervention was based, the following domains were assessed: drug- and sex-related HIV-risk reduction knowledge (information component), personal and social motivation to reduce HIV-risk behavior (motivation component), and self-efficacy about reducing HIV-risk behavior (behavioral skills component).

Four items were used to assess knowledge about safer sex and safer injection drug use (e.g., "If an HIV+ person only has sex with another HIV+ person, they don't need to use condom"; "If an

Table 1. Descriptive analysis of the outcome variables (means and standard deviations).

Outcome variables	Pre-test	Post-test
Sex-related risk reduction		
Knowledge (2 items, 0–100)	69.5% (31.6%)	79.8% (26.6%)
Social motivation (1 item, 1–5)	4.44 (1.14)	4.74 (0.72)
Personal motivation (2 items, 1–5)	4.20 (0.98)	4.50 (0.79)
Self-efficacy (2 items, 1–5)	3.46 (1.34)	3.52 (1.22)
Reported condom use (1 item, 1–6)	4.37 (1.93)	4.42 (1.93)
Drug-related risk reduction		
Knowledge (2 items, 0–100)	83.4% (29.3%)	92.4% (19.8%)
Social motivation (1 item, 1–5)	4.58 (0.88)	4.65 (0.86)
Personal motivation (2 items, 1–5)	4.71 (0.58)	4.85 (0.40)
Self-efficacy (2 items, 1–5)	4.36 (0.84)	4.33 (0.88)
Reported drug use (1 item, 1–6)	5.93 (0.35)	5.93 (0.27)
Sample size	151	151

HIV+ person shared needles with another HIV+ person, they don't need to clean the needles"; see Table 1 for details). Percentage correct of the knowledge items was calculated separately for drug- and sex-related items. Participants' personal motivation to use condoms (two items, $r=0.13$) and clean needles (two items, $r=0.15$) were measured in terms of their reported determination to reduce risk, using a five-point Likert scale. Using the same scaling, social motivation was measured in terms of their reported perception of significant others' beliefs about the importance of using condoms and using clean needles (one item each). As in prior behavioral intervention studies (Copenhaver & Lee, 2007; Copenhaver et al., 2007; Fisher et al., 2004), personal and social motivation constructs were measured separately as this allowed us to explore whether changes in HIV-risk reduction outcomes were differentially influenced by these diverse, but equally important, sources of motivation. Using a five-point Likert scale, two items each assessed participants' behavioral skills in terms of their self-efficacy about abstaining from sexual activity and using a condom ($r=0.34$) and about abstaining from injection drug use and using clean needles ($r=0.44$).

A similar version of this brief assessment has been used in a randomized study of an evidence-based intervention (OPTIONS; Fisher et al., 2004) in order to expeditiously inform intervention clinicians about

HIV-related information, motivation, and behavioral skills deficits among participants. Participants completed pre-test measures immediately before participating in their first intervention session and completed post-test measures immediately after participating in their fourth (final) session. Pre- and post-test measures each took approximately 15 minutes to complete.

Based on the brief IMB-based assessment, confirmatory factor analyses were used to test the IMB model on drug- and sex-related HIV-risk reduction outcome measures using AMOS 5.0 (see Copenhaver & Lee, 2007). The model indices for sex-related outcomes were acceptable, Chi-square ($df=11$) = 7.02, $p=0.54$, CFI = 1.00, RMSEA = 0.00, as were those for drug-related outcomes, Chi-square ($df=11$) = 12.13, $p=0.44$, CFI = 1.00, RMSEA = 0.00.

Data analysis for the present study

In the present study, we examined differences in HIV-risk reduction outcomes between parents either living with their children or not. A univariate analysis of variance with participant sex and living arrangement as independent variables and age as a dependent variable showed that parents who lived with their children tended to be younger (36.9 vs. 42.3 years) than those who did not live with their children, $F(1, 147) = 13.32$, $p < 0.0001$. No between group or gender differences were found across any other demographic variables we measured including: marital status, highest education level, injection drug use, primary language, employment status, race/ethnicity, or spouse's drug use history. Thus, age was the only variable entered as a covariate in the analysis.

The data analytical strategy was a 2 (gender) \times 2 (living arrangement: living with vs. not living with their children) model with change scores as the dependent variables and participant age as well as the interaction of participant gender and age entered as covariates. The selected change score analysis strategy is particularly appropriate when examining intervention effects on multivariate outcomes (Maxwell & Howard, 1981). The analysis examined pre- to post-intervention changes in the following dependent variables organized by HIV-risk domain: drug-related HIV-risk reduction (HIV knowledge, social motivation, personal motivation, self-efficacy, and reported behavior) and sex-related HIV-risk reduction (HIV knowledge, social motivation, personal motivation, self-efficacy, and reported behavior). Due to the use of different scaling across measures, scores were standardized before the analyses were conducted. Results are reported below only when the

omnibus *F* tests reached at least a marginal significance level ($p < 0.10$).

Results

The outcomes of the CHRP intervention have been reported elsewhere (Copenhaver & Lee, 2007; Copenhaver et al., 2007) and, in short, demonstrated positive intervention effects with regard to drug- and sex-related HIV-risk reduction among IDU participants. The primary purpose of this secondary analysis was to explore possible gender differences in terms of the influence that living with children had on parents' outcomes following the CHRP intervention.

Overall, participants living with their children demonstrated greater improvement in sex-related HIV knowledge, $F(1, 145) = 5.97, p = 0.016$, and self-efficacy to reduce sex-related HIV risk, $F(1, 145) = 3.88, p = 0.051$, vs. those not living with their children. Parents living with their children were also more likely (marginally) to report greater gains in drug-related HIV knowledge, $F(1, 145) = 3.42, p = 0.067$ (Figure 1).

A gender \times living arrangement interaction was demonstrated, which was primarily driven by improvements in social motivation to reduce drug-related HIV risk, $F(1, 145) = 11.02, p = 0.001$ (Figure 2) and personal motivation to reduce drug-related HIV risk, $F(1, 146) = 4.88, p = 0.029$ (Figure 3), among a subgroup of fathers. Interestingly, fathers living with their children showed relatively greater improvements in social and personal motivation to reduce drug-related HIV risk following the intervention vs. fathers not living with their children while mothers demonstrated just the opposite pattern (Figures 2 and 3).

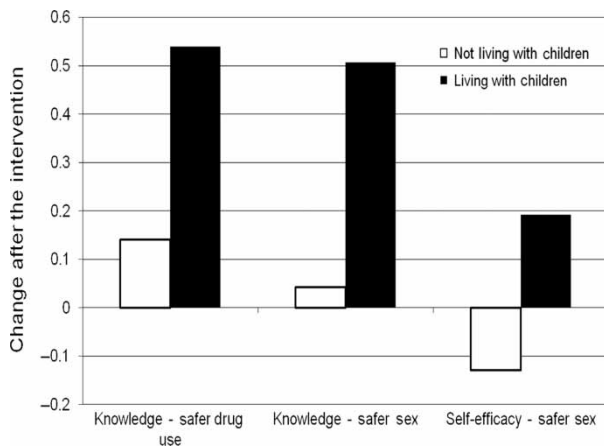


Figure 1. Sex- and drug-related HIV knowledge and self-efficacy among parents living with vs. not living with their children.

Note: Positive scores indicate improvement following intervention.

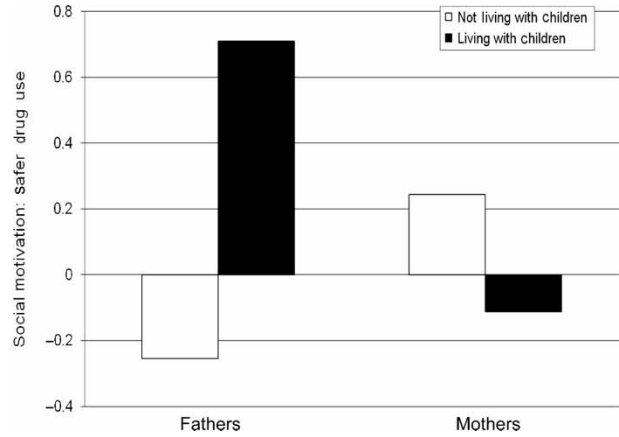


Figure 2. Social motivation to reduce drug-related HIV risk among parents living with vs. not living with their children.

Note: Positive scores indicate improvement following intervention.

Thus, findings suggest a parenting role that includes residing with children may differentially influence IDU parents' motivation to reduce drug-related HIV risk as a function of gender.

Discussion

Recent research suggests that enhancing the parenting role may stimulate favorable drug treatment outcomes among IDU fathers participating in drug treatment (McMahon & Rounsaville, 2002; McMahon et al., 2002, 2007, 2008). The present analysis was designed to expand the literature by exploring the extent to which a parenting role that included residing with their children was associated

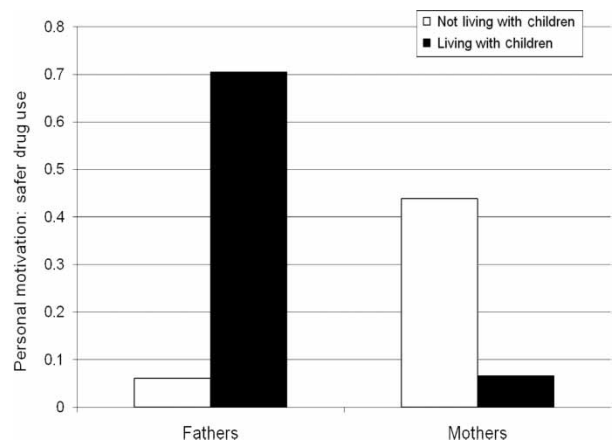


Figure 3. Personal motivation to reduce drug-related HIV risk among parents living with vs. not living with their children.

Note: Positive scores indicate improvement following intervention.

with enhanced outcomes among IDU parents following an HIV-risk reduction intervention.

Of particular interest, our results suggest that fathers residing with children may have differentially benefited from the CHRP intervention compared with mothers. Although the entire subgroup of parents living with their children reported relatively low levels of motivation to reduce HIV risk, fathers tended to respond more favorably to the intervention than did mothers. In accordance with prior research with fathers (e.g., Eggebeen & Knoester, 2001; Knoester & Eggebeen, 2006), it is plausible that the parenting role inherent in residing with their children positively influences fathers' responsiveness to the intervention content. Mothers who reported living with their children, in contrast, did not tend to respond to the intervention in the same way.

Considering our findings in the context of prior studies with parents (e.g., Copenhaver, 1996; Craig, 2006; Eggebeen & Knoester, 2001; Knoester & Eggebeen, 2006), the gender differences that were demonstrated were likely driven by the discrepant parenting roles assumed by fathers vs. mothers living with children. Future research should be designed to specify both qualitative and quantitative differences in the parenting roles assumed by IDU mothers and fathers as a function of residence in an effort to better understand how these roles may support responsiveness to behavioral interventions. Such information could ultimately provide an empirical basis for testing the efficacy of incorporating parent-specific intervention content in order to bolster outcomes not only in terms of knowledge, motivation, and behavioral skills, but also in terms of target outcome behaviors. Given that behavioral interventions remain our primary tool for reducing HIV-risk behavior (Kalichman, 2008), and given that current behavioral approaches produce relatively modest effect sizes (e.g., Copenhaver et al., 2006), such additional means for boosting outcomes, could result in a meaningful impact.

The limitations of the present study should be acknowledged. Our data were obtained from a larger community-based clinical intervention study with participants serving as their own controls, rather than using a more stringent randomized controlled design. As noted elsewhere (Copenhaver et al., 2007), however, among our primary outcomes were objective improvements (e.g., significant gains in participants' knowledge pertaining to both drug- and sexual-related risks) that cannot readily be explained as due to experimental artifacts such as demand characteristics. Given the exploratory nature of this secondary analysis, we also chose to report outcomes that reached marginal levels of significance (e.g., $p < 0.06$; $p < 0.07$)

in addition to those outcomes that reached conventional levels of significance (i.e., $p < 0.05$). In addition, the items comprising the sex- and drug-related personal motivation constructs were found to correlate only weakly with each other, suggesting that inclusion of better items and/or a greater number of items may improve the precision in measuring these constructs. Notwithstanding the limitations, this study contributes to the HIV prevention literature by spurring future research designed to understand and optimize the impact of interventions targeting IDU parents in drug treatment.

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