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Restoring healthy developmental trajectories for sexually-exploited young runaway girls: Fostering protective factors and reducing risk behaviors

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Abstract

Purpose—To examine effects of the Runaway Intervention Program (RIP), a strengths-based home visiting, case management, and group support program for sexually-assaulted or exploited young runaway girls; staffed by advanced-practice nurses, RIP aims to restore healthy developmental trajectories by re-establishing protective factors, reducing trauma responses, and lowering risk behaviors that are common sequelae of sexual violence.

Methods—Quasi-experimental study of RIP girls (N=68) ages 12–15 (mean, 13.75 years), assessed at baseline, 6 and 12 months for changes in family and school connectedness, other adult caring, self-esteem, emotional distress, suicidality, recent substance use, plus risky sexual behaviors. Responses at each time were also compared to non-abused and abused urban 9th grade girls (mean age, 14.64, N=12,775) from the 2004 Minnesota Student Survey (MSS). Analyses used paired t-tests, McNemars test, Wilcoxon sign-rank, chi square and Pearson's correlations.

Results—At entry, RIP girls were most like sexually-abused MSS peers, with lower levels of protective factors and higher levels of distress and risk behaviors than non-abused MSS girls ($p < .05$ to $p < .01$). However, they saw significant improvements by 6 and 12 months, such that all measures of protective factors, positive development, distress and risk behaviors more closely resembled non-abused MSS girls by 12 months. Of equal note, RIP girls with the greatest emotional distress, the lowest levels of connectedness, and lowest self-esteem at baseline demonstrated the greatest improvement (all $p < .001$).

Conclusion—This appears to be a promising intervention for restoring sexually-abused runaway girls to a healthy developmental trajectory.

Keywords

adolescents; runaways; sexual abuse; sexual exploitation; protective factors; substance use; suicide attempt; contraception; teen pregnancy; home visiting

Running away and its associated risk of sexual exploitation is a significant public health concern. In Minnesota nearly 15% of girls in grade 9 have run away in the past year (1). Studies among runaway and street-involved youth suggest as many as 1 in 3 runaways have been sexually assaulted or exploited, i.e., traded sexual activities for money, drugs, shelter, or other resources(2). Although these studies find similar rates of sexual exploitation for boys and girls, other studies have found boys far less likely to disclose sexual assault, and sexually abused boys accessing clinical services are seldom runaways (3). In order to prevent long term health sequelae common to sexually exploited young runaway girls, the Minnesota Runaway Intervention Program (RIP) was created for runaway girls ages 12 to 15 (4). The program aims to re-establish positive developmental trajectories, reduce girls' traumatic responses, and improve health and coping behaviors. This study examined the effects among participants during the first two years of the intervention.

Background

The health and developmental disparities of runaway and sexually abused adolescents can best be understood through the ecological theories that have informed child development, (5,6) and the derailing effects of child maltreatment, especially sexual abuse (7,8). These theories identify environmental and relational influences that increase vulnerability to stress, often through the violence and trauma from sexual abuse. The altered physiological and cognitive responses that result from potent environmental stressors during development lead to extreme responses such as self-harm and suicide attempts, as well as risk behaviors such as substance use and risky sex, especially when supported by risk-laden environments. However, there are potential protective factors in environments and relationships that can help buffer these risks. This theoretical framework guides both our understanding of sexually assaulted runaways' health risks, and identifies points where intervention may reduce ineffective coping and restore positive developmental trajectories (Figure 1).

Life can be dangerous for youth when they run away or are kicked out of their homes. Even when the time away is relatively short, youth are at risk for violence(9). This risk is accentuated because many runaways have already experienced familial abuse (10, 11), which can include repeated exposure to physical or sexual victimization. For some youth, poly-victimization is a chronic experience(12).

Adolescents usually run away or are kicked out repeatedly before becoming persistently street involved(11, 13). Most youth return home, at least for awhile (14), but while on the street they are extremely vulnerable, especially younger adolescents. Services are less available for younger teens and those who are not street-entrenched. This may miss an important early period for teens and their families when interventions may reduce negative health outcomes(3, 11, 13). Some studies have evaluated interventions aimed at reducing risk behaviors, but focused only on youth accessing shelters (15, 16) or older homeless adolescents(17, 18).

Runaway youth experience high rates of sexual health issues, including sexually transmitted infections (STIs) and teen pregnancy (10, 19). These are linked to childhood sexual abuse

(10, 20), sexual exploitation or survival sex once they have run away(2), and substance abuse while homeless(21).

The multiple traumatic events runaways experience often result in mental health problems. They have higher rates of depression, post traumatic stress disorder, self-harming behaviors, suicide ideation and attempts(11, 22). Homeless and runaway teens also have high rates of substance abuse(23).

Protective factors, also known as supportive resources or assets, help all youth succeed(5). Abused or runaway teens with higher levels of protective factors are less likely to engage in suicide, violence, and problem substance use, and more likely to report positive health, better school performance, and post-secondary aspirations(24). The strongest protective factors are based on connectedness to school, family, other adults, and friends with positive social values(5, 24). A few intervention studies have used positive youth development approaches to foster protective factors, usually in order to reduce risk behaviors (16, 25).

Based on our clinical experience, it seems programs work best for teens who already have some protective factors in their lives. Runaway youth with multiple risk exposures, and those with limited supportive resources, can be so difficult to find or to engage that interventions may have limited effectiveness. Unfortunately, none of the studies we reviewed (15,16,18,25) had explored differential effects of their interventions, i.e., who improves most (or least).

The purpose of this study was to examine the effectiveness of a runaway intervention program designed to restore positive family and school relationships and increase self-esteem, and through this reduce emotional distress and risk behaviors among sexually exploited young runaway girls in Minnesota.

Methods

Because no evidence-based standard of care has already been documented for sexually exploited young runaways, a randomized clinical trial was not deemed ethically responsible at this stage of knowledge. Therefore, we undertook a quasi-experimental study in which enrolled participants served as their own controls from baseline to 6 and 12 months. We included a general population comparison group, 9th grade girls both with and without a history of running away and sexual abuse, who participated in the Minnesota Student Survey of 2004 (MSS). This study was approved by the Institutional Review Board of Children's Hospital and Clinics of Minnesota and by the Behavioral Research Ethics Board of the University of British Columbia.

The Intervention

RIP is part of a hospital-based Child Advocacy Center that diagnoses and treats child maltreatment, including sexual abuse. Designed for young runaway girls (ages 12–15) who have also experienced sexual assault or sexual exploitation, RIP provides a comprehensive forensic assessment and health examination at baseline, and up to 12 months of home visiting, health care, health education, and case management by Advanced Practice Nurses

(APN), plus access to an optional weekly girls' empowerment group conducted by licensed psychotherapists. Using a strengths-focused approach, the APNs work with girls and their families to help girls return home and return to school, improve family interactions, and help navigate juvenile justice, chemical dependency treatment, and health care as needed. They provide contraception, health education, STI and pregnancy testing, and mental health screening; they also help girls with goal-setting and developing self-care skills, and connect them with opportunities such as camps or extracurricular clubs. The goal of RIP is to reduce the traumatic distress girls report, to increase supportive relationships and protective factors in their lives, and to prevent or reduce common risk behavior sequelae of sexual abuse or sexual exploitation. The program provides services to 35–40 girls per year with 1.1 FTE of nurse staffing, and 3 hours per week of therapist time, with an estimated cost of \$2500–\$3000 per case. A detailed description of the intervention's evidence-based components has been published elsewhere(4).

Sample

The index group (RIP girls) included all patients enrolled in RIP during 2006 and 2007 who received services for at least 6 months (N=68) and have any 6 months and/or 12 months follow-up data. During those two years a total of 84 patients were enrolled, but 7 of these did not participate at all (3 moved away with family, 1 was placed in distant foster care, 1 was incarcerated, 1 opted into a culturally-specific related program, and 1 ran away right after enrollment and was lost to follow-up). Of the 77 who received any services, 5 left within the first 3 months, 1 was incarcerated, and 3 moved away, so 12% do not have data at 6 or 12 months. Thus, 88% of those who received any services had 6 or 12 months data.

The comparison group was 9th grade girls in the 2004 MSS from the 7-County Metropolitan Area around Minneapolis and St. Paul (N=12,775). The MSS is a statewide census survey of students in grades 6, 9, and 12 in participating school districts. For comparisons to RIP girls, MSS girls were grouped into separate categories based on self-reported intrafamilial and/or extrafamilial sexual abuse. Demographic information is provided in Table 1. Although the urban population of 9th grade students is significantly less ethnically diverse than RIP girls and includes families across all socio-economic strata, while most RIP girls came from low-income families, we felt this comparison to the full population was a more stringent approach.

Measures

The measures used are described in Table 2. At entry into RIP, girls completed a baseline assessment of outcome measures from the 2004 MSS. These included: scales for family and school connectedness, self-esteem, and levels of emotional distress in the past 30 days, as well as single-item measures of educational aspirations, suicidal ideation and attempts, current sexual risk and health behaviors, and various substances used in the past month. The baseline assessment also included the 10-item Trauma Screening Questionnaire (TSQ)(27), as well as full physical exam, past medical history, STI and pregnancy tests, and assessment of current contraceptive methods. Follow-up assessments were conducted at 6 and 12 months using the same measures. Psychometric evaluation of scales with RIP and MSS girls showed strong levels of reliability and appropriate unidimensionality (data not shown);

Cronbach's alphas ranged from .81 to .93 for all scales among RIP girls, from .82 to .91 for all scales among MSS girls. Baseline and follow-up assessments were done by nurses who did not provide the intervention, but were part of the same clinic.

Analyses

For measuring improvement over time within RIP girls, we compared their individual scores at baseline to 6 and 12 months scores using paired t-tests, Wilcoxon sign-rank tests, and McNemar tests, depending on the type of outcome measure. To compare their responses to girls in the general population, we calculated 95% confidence intervals for mean scores of continuous measures for each abuse group of MSS girls, and among RIP girls at each time; for comparison of key dichotomous measures, we used chi square tests, which are robust to large differences in group sizes. Given the large sample size and the multiple analyses in comparing the 4 groups in the MSS to the 3 time periods of the RIP girls, we set the alpha for those analyses to .01.

In addition to these measures of effectiveness, we were interested in exploring potential differences in effect sizes among RIP girls, i.e., which girls improve most or least? To examine this, we computed change scores for emotional distress, self esteem, family and school connectedness, and other adult caring, subtracting baseline scores from scores at 6 and 12 months. We then calculated Pearson correlations between change scores and age, as well as change scores and baseline scores; this allows us to determine if older or younger girls experienced larger or smaller changes, and similarly, those who enter with higher or lower levels of connectedness, self-esteem or distress.

Results

RIP cases were somewhat younger, on average, than the 9th grade MSS comparison girls, and were far less likely to be white, because the original intervention was first funded within the Hmong community, and only included girls from all ethnic groups during the second year. While it is impossible to determine what types of extrafamilial sexual abuse MSS girls experienced, this was assessed among RIP girls. They reported severe levels of sexual exploitation and assault: 13.8% had been prostituted, 6.1% had been gang raped, 33.8% reported sexual abuse by multiple perpetrators at different times, 26.8% reported repeated abuse by the same person, 23.1% reported sexual assault one time by one perpetrator, and 1 reported rape by a stranger (some cases reported multiple types of experiences). Only 4.6% of RIP girls reported incest in addition to extrafamilial abuse, because incest cases were eligible for services through Child Protection Services, and so were referred to CPS. RIP girls also reported evidence of significant trauma; at entry, 58.4% were cutting, 51.7% reported suicidal ideation and 20% reported suicide attempts in the past year. On the TSQ, 30.4% reported 1 or more symptoms in the past week.

Longitudinal Improvements within Cases

RIP girls showed significant improvement from entry to 6 months, and many improvements were sustained at 12 months (Table 2). For protective factors, being able to talk to mother about problems improved at both 6 and 12 months, but talking to father about problems was

significantly better only at 6 months. Family connectedness improved at 6 months, but, although higher, was not significant at 12 months; girls reported feeling cared about by other adults at 6 months, but not at 12 months (after most home visits ended). All three of these showed low power for 12-months comparisons in post-hoc power calculations. School-related protective factors were more likely to be sustained: school connectedness, liking school, and self-reported grades were significantly higher at both 6 and 12 months. Educational aspirations were not significantly different at 6 months, but by 12 months, were higher than at entry. Girls reported significantly higher self-esteem at both times.

RIP girls also showed significant improvement in a number of risk behaviors and negative health outcomes (Table 2). Emotional distress scores decreased significantly at both 6 and 12 month, as did suicidal ideation and attempts. Alcohol use and smoking in the past month significantly declined at both times. Other drug use declined, including frequency of marijuana use in the past month, use of crystal methamphetamine, ecstasy, and cocaine. Sexual risk and health behaviors showed the strongest improvements. Nearly half the girls improved condom use at last intercourse, and a similar rate reported improvement in effective contraception use at 6 months, which was sustained at 12 months. RIP girls also reported significant declines in the number of sexual partners. There were 2 pregnancies among RIP girls at 6 months (3.0%), and 3 pregnancies by 12 months (6.1%); while a significant increase over baseline (pregnant girls were excluded from RIP and referred to other services), still significantly lower than among sexually abused 9th grade girls in Minnesota.

Comparisons to Students in the General Population

As would be expected, non-abused MSS girls reported significantly higher levels of protective factors and lower rates of risk behaviors than their peers who reported incest, extra-familial abuse only, or both types of abuse (see Table 3). Sexually abused MSS girls were also significantly more likely to report running away than non-abused girls. At entry to the intervention, RIP girls' protective factor scores were significantly lower on average than non-abused MSS girls' scores, and were similar to or lower than abused MSS girls' scores, except their school connectedness scores were higher than abused MSS girls, and were not different from non-abused MSS girls. RIP girls also reported higher rates of emotional distress and recent suicidal ideation and attempts than non-abused girls, with rates that were similar to abused girls (incest, $\chi^2=0.48$, extrafamilial abuse, $\chi^2=0.01$, both types, $\chi^2=2.17$, all NS). However, RIP girls reported significantly higher levels of alcohol, marijuana, and other drug use than any MSS group (all $p<.01$), as well as much lower prevalence of condom use than either non-abused ($\chi^2=56.6$) or abused MSS girls (incest, $\chi^2=35.5$, extrafamilial, $\chi^2=36.9$, both types $\chi^2=25.5$, all $p<.001$).

At 6 months, RIP girls' family connectedness scores were significantly higher than MSS girls with extra-familial abuse, although still lower than non-abused girls; school connectedness was higher than all MSS groups, while other adult caring and self-esteem scores were similar to non-abused girls' scores, and significantly higher than the mean scores of abused girls. RIP girls' scores also were better than abused girls' in emotional distress, and they reported lower prevalence of suicidal ideation and attempts (e.g., vs. both

types of abuse, $\chi^2=28.4$, $p<.001$). They no longer had a higher prevalence than abused girls in recent alcohol, cannabis, or other drug use, although prevalence was still higher than among non-abused MSS girls, and condom use at last intercourse was not significantly different from any MSS group ($\chi^2=.01$, .48, 2.7, 4.3 respectively).

At 12 months, RIP girls showed sustained improvements in family connectedness, other adult caring, significantly higher school connectedness and self esteem, and lower emotional distress, than the MSS groups, looking most like the non-abused group. They were no longer different from non-abused MSS girls in alcohol or drug use, or condom use at last intercourse, and had significantly lower rates of suicidal ideation and attempts than even non-abused girls.

Who does better?

Although results were quite positive for the Runaway Intervention Program, not all girls improve uniformly or consistently, so we explored for whom RIP has greater effects. Older adolescents, with increased cognitive maturity, may do better than younger teens. However, age was not significantly correlated with the size of change for any measures, except girls who entered RIP at older ages reported a smaller improvement in family connectedness at 12 months ($r = -.299$, $p<.05$).

Similarly, a program may be more effective among those who have at least some support and resources, and thus would have less effect for girls with the most complex problems, greatest distress, lowest self-esteem, and poorest connections to family and school. The Runaway Intervention Program did not fit this pattern: instead, we found school connectedness was negatively correlated at 6 months ($-.65$) and 12 months ($-.64$), as was family connectedness ($-.60$ at 6 months, $-.68$ at 12 months), self-esteem ($-.64$ & $-.60$), other adults caring ($-.62$ & $-.69$), and emotional distress ($-.55$ & $-.57$, all $p<.001$). This means those with the lowest baseline school, family, or other adult connectedness, lowest self esteem, and highest emotional distress actually improved the greatest amount, and those with the highest connectedness and self-esteem at baseline improved the least, suggesting RIP is more effective with those at high risk.

Discussion

At entry to the Runaway Intervention Program, girls were most like their sexually-abused peers in the general student population, with lower levels of protective factors and higher levels of risk behaviors than non-abused girls. They saw significant improvements by 6 and 12 months, such that all measures of positive development, trauma responses and risk behaviours more closely resembled non-abused girls' responses. Those who started with the greatest distress, lowest levels of support, and lowest self-esteem actually improved most. This appears to be a promising intervention for restoring sexually-abused runaway girls to a healthy developmental trajectory.

Other studies⁽²⁵⁾ have tested positive youth development interventions for high-risk groups, theorizing that restoring protective factors in teens' lives will reduce their risk behaviors. While these studies have usually demonstrated lower risk behaviors, very few have also

tested whether protective factors actually increased, making it difficult to conclude this mechanism was the actual source of improvement. In our study, we have shown both improvement in protective factors and reduction in trauma and risk behaviors from an intervention that addresses key relationships in teens' lives, improves self-care skills, and offers ready access to health care for vulnerable young teens.

There are limitations to our study. We were unable to randomize cases, so it is possible all sexually abused or exploited runaway girls in the study might have improved without intervention. However, our general population comparison group from the same metropolitan area could not have received the intervention, yet showed abused girls were more similar to RIP girls at entry, but not at 6 or 12 months. The MSS group's sexual abuse was self-reported, without information about severity or frequency of abuse; some girls may not have disclosed abuse and so were included as non-abused girls, potentially masking differences between RIP and non-abused MSS girls. The large cohort and strong differences in responses between abused and non-abused MSS girls strengthens the likely accuracy of findings.

Another limitation is length of follow-up; the comparison group is cross-sectional data, and outcomes for RIP girls are only reported up to 12 months, so positive results may not be sustained long-term. However, most RIP girls receive limited intervention after 6 months, yet several positive effects were sustained at 12 months, suggesting longer-term benefits. For those areas where there was low or no change between 6 and 12 months, it is unclear whether results were due to attenuation of effects, lower power with the smaller sample of 12 months follow-up, or normal decreases in family and school connectedness as teens get older. The intervention may need boosters to sustain effects.

The majority of RIP girls are from ethnic minority populations, most notably from the Southeast Asian Hmong community; although most Hmong girls are second or third-generation immigrants and acculturated to Midwest American teen culture, family cultural influences may be different for other ethnic groups, and the intervention may be more or less effective among European-heritage or Native American girls, the smallest groups in our intervention. Finally, this intervention was designed for girls; runaway sexually exploited young boys may need different services.

Conclusion

This strengths-focused home visiting, health education and case management intervention by APNs appears to be an effective strategy to restore healthy connections, positive self-care behaviors, and reduce risk behaviors among sexually exploited young runaway girls. Although an intensive intervention, results were achieved at a cost that is in line with costs for home-visiting and case management programs for other at-risk groups (4, 27), but with stronger effects. Further, using APNs reduces the need for extensive staff training in the intervention model. This intervention should be further tested and potentially adapted for other ethnic groups of girls, as well as in other regions, with older girls, with boys, and with longer-term follow-up.

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Figure 1.
Theoretical model for the Runaway Intervention Program

Table 1

Demographic characteristics of RIP cases and MSS comparisons.

	RIP cases* (n=68)	Urban MSS cases (n=12,775)
Mean age (SD), years	13.75 (1.13)	14.64 (.52)
Mean grade (range)	8.38 (6–11)	9
Ethnicity %		
White	12.3%	74.1%
African American	12.3%	6.9%
Hmong/Asian	55.4%	8.2%
Hispanic	3.1%	2.8%
American Indian	3.1%	0.7%
Multi-ethnic	12.3%	7.3%
Abuse type %		
no sexual abuse	0	89%
incest only	0	2.0%
extra-familial only	95.4%	6.9%
both incest & extra-familial	4.6%	2.2%
Ran away in past year	100%	14.6%
Ran away in past year by type of abuse for MSS:		
No abuse	--	11.6%
Incest only	--	32.1%
Extra-familial only	100%	37.9%
Both types of abuse	100%	47.6%

*
At entry to intervention

Table 2

Description of Measures

Measure	# of items	Score range	Example item content	Response Options
Family connectedness	5	1–5	Extent to which family cares about you, understands you, has fun together, respects privacy	Not at all, A little, Some, Quite a bit, Very much
Can talk to mother about problems	1	1–4	Can you talk to your mother about problems you are having?	Yes, most of the time, Yes, some of the time, No, not very often, No, not at all
Can talk to father about problems	1	1–4	Can you talk to your father about problems you are having?	Yes, most of the time, Yes, some of the time, No, not very often, No, not at all
Other adults care	5	1–5	How much you feel teachers, police, church or spiritual leaders, other adults in community, and other adult relatives care about you	Not at all, A little, Some, Quite a bit, Very much
Like School	1	1–5	How much you like school	Not at all, A little, Some, Quite a bit, Very much
Educational Aspirations	1	1–5	Which of these best describes your school plans?	From Quit school as soon as I can, to Go to college and then go on after college to graduate or professional school
School connectedness	5	1–5	How many teachers interested in you as a person, show respect for students How much teachers care about you, how much you like school	All, Most, Some, A few, None Not at all, A little, Some, Quite a bit, Very much
Grade Point Average	2	0–4	Self-reported two grades you get most often	A(4), B(3), C(2), D(1), F(0)
Self Esteem	7	0–3	Rosenberg self-esteem scale; feel good about self, feel satisfied with life, feel do not have much to be proud of, think I can't do anything right, etc.	Disagree, Mostly Disagree, Mostly Agree, Agree
Suicidal ideation	1	0–1	Have you ever thought about killing yourself	No, Yes during the last year
Suicide attempts	1	0–1	Have you ever tried to kill yourself?	No, Yes during the last year
Emotional distress past 30 days	6	0–4	During past 30 days, extent of feeling sad, discouraged, nervous, stressed, hopeless	Variations on: None at all to Almost more than I could take, None of the time to All of the time, etc.
Condom use last sex	1	0–1	The last time you had sexual intercourse, did you or your partner wear a condom?	No, Yes, I don't have sexual intercourse

Table 3

6-month and 12-month outcomes for RIP cases

	6 Month Outcomes (compared to entry)			12 Month Outcomes (compared to entry)		
	Mean diff	t ^a or Z ^b	p	Mean diff	t ^a or Z ^b	p
Protective factor changes						
Family connectedness (1–5)	0.39	2.39	<.05		NS [*]	
Can talk to mother about problems (1–4)	0.87	6.10	<.001	0.83	4.24	<.001
Can talk to father about problems (1–4)	0.51	3.05	<.01		NS [*]	
Other adults care (1–5)	0.39	2.38	<.05		NS [*]	
How much like school (1–5)	0.60	3.03	<.01	0.60	2.43	<.05
Educational aspiration (1–5)		NS		0.82	3.75	<.001
School connectedness (1–5)	0.36	2.36	<.01		NS	
Self-reported grades (%with better grades) ^b	55%	-2.56	<.01	58%	-2.92	<.01
Self-esteem (1–5)	0.45	4.58	<.001	0.64	5.09	<.001
	% better over entry	Z ^b or chi ^c	p	% better over entry	Z ^b or chi ^c	test
Risk behaviors and negative outcomes changes						
# days used alcohol past month	68%	-2.73	<.01	65%	-2.69	<.01
# days smoked tobacco past month	37%	-2.42	<.05	75%	-2.77	<.01
# days used cannabis past month	-	NS	-	77%	-3.45	<.001
Used any other drugs past month	44%	-3.80	<.001	55%	-4.81	<.001
Cocaine/crack use past 3 months	-	NS	-	21%	-2.06	<.05
Ecstasy use in past 3 months	29%	-2.04	<.05	25%	-2.04	<.05
Crystal meth use past 3 months	24%	-2.10	<.05	39%	-2.59	<.01
Emotional distress (mean difference) ^a	-0.55	-4.56	<.001	-0.70	-5.07	<.001
Suicidal ideation, past year ^c	44%	c	<.001	57%	c	<.001
Suicide attempts, past year ^c	20%	c	<.01	21%	c	<.01
# Sexual partners past 3 months (0 to 7+) ^a	-2.45	-5.01	<.001	-3.22	-4.83	<.001
Condom use last sex ^c	50%	c	<.001	56%	c	<.001
Effective contraception currently used ^c	43%	12.25	<.001	46%	11.17	<.001

^a paired t-test,

^b Wilcoxon sign-rank test,

^c McNemar's test NS=not significant

* post-hoc power analysis suggests underpowered

Table 4

Comparisons between Urban MSS by Abuse and RIP at entry, 6 & 12 months

	Urban MSS 2004 9 th grade girls (n=12,775)			
	No abuse	Incest only	Extra-familial only	Both types of abuse
Family connectedness (95% CI)	2.71 (2.70, 2.72)	2.11 (2.02, 2.20)	2.06 (2.04, 2.13)	1.77 (1.68, 1.85)
School connectedness (95% CI)	2.39 (2.38, 2.40)	2.22 (2.17, 2.28)	2.03 (2.00, 2.06)	1.95 (1.90, 2.00)
Other adults care	2.30 (2.30, 2.31)	2.03 (1.95, 2.12)	1.83 (1.80, 1.87)	1.70 (1.59, 1.73)
Self esteem (95% CI)	2.13 (2.12, 2.14)	1.77 (1.70, 1.84)	1.65 (1.62, 1.68)	1.44 (1.39, 1.50)
Emotional distress (95% CI)	1.66 (1.65, 1.67)	2.09 (2.02, 2.16)	2.25 (2.22, 2.28)	2.46 (2.40, 2.52)
Suicidal ideation past year	24%	47%	52%	62%
Suicidal attempts past year	7%	23%	29%	42%
Alcohol use past month	26%	41%	53%	56%
Cannabis use past month	9%	19%	28%	33%
Illicit drug use past year (not alcohol & cannabis)	10%	24%	37%	43%
Ever pregnant	8%	25%	15%	27%
Condom use at last sex	69%	70%	63%	59%
	At Entry	RIP Cases 6 months (n=68)	12 months (n=52)	
Family connectedness (95% CI)	1.96 (1.80, 2.12)	2.35 (2.20, 2.49)	2.35 (2.19, 2.52)	
School connectedness (95% CI)	2.30 (2.20, 2.41)	2.66 (2.56, 2.76)	2.68 (2.55, 2.82)	
Self esteem (95% CI)	1.62 (1.54, 1.71)	2.07 (1.99, 2.15)	2.23 (2.13, 2.33)	
Other adults care (95% CI)	1.96 (1.81, 2.11)	2.37 (2.24, 2.50)	2.27 (2.12, 2.42)	
Emotional distress (95% CI)	2.22 (2.12, 2.32)	1.68 (1.57, 1.78)	1.47 (1.35, 1.59)	
Suicidal ideation past year (χ^2 vs. non-abused)	52% (24.4, p<.001)	5% (8.7, p<.01)	0 (12.6, p<.01)	
Suicidal attempts past year (χ^2 vs. non-abused)	20% (14.2, p<.01)	0 (3.7, NS)	0 (3.2, NS)	
Alcohol use past month (χ^2 vs. non-abused)	80% (90.0, p<.001)	44% (6.7, NS)	37% (2.5, NS)	
Marijuana use past month (χ^2 vs. non-abused)	77% (258.3, p<.001)	27% (12.8, p<.01)	9% (.006, NS)	
Illicit drug use past year (not alcohol or cannabis) (χ^2 vs. non-abused)	61% (166.9, p<.001)	15% (.91, NS)	7% (0.59, NS)	
Ever pregnant (χ^2 vs. non-abused)	0% *	3% (2.5, NS)	6% (0.32, NS)	
Condom use at last sex (χ^2 vs. non-abused)	23% (56.6, p<.001)	66% (2.9, NS)	77% (0.01, NS)	
Effective contraception (not included in MSS)	51.5%	90%	88%	

* Pregnant girls not enrolled, referred elsewhere NS=not significant