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Predictors of depression among justice involved youth

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Abstract

Depressed mood remains a significant mental health problem among justice involved youth. There is a well-established correlation between depressed mood and conduct problems (e.g., conduct disorder and oppositional defiant disorder) during childhood and adolescence, which tends to become more prevalent during adolescence. Studies suggest early problems with both depression and delinquency can lead to difficulties with school success, substance use, continued depression and criminal offending in adulthood. Teplin and Associates [35] found among Cook County, Illinois detained youth that 15 years after detention, 52.3% of males and 30.9% of females still had a psychiatric disorder. Informed by the research literature, we conducted a study of the demographic, background and psychosocial predictors of depression among newly arrested male and female youth admitted to a centralized juvenile assessment center in a southern U.S. city. Multi-group Bayesian regression analysis found male and female youth whose parents had been in jail or prison had higher depression scores, than youth whose parents had not been incarcerated. In addition, female youth who experienced sexual assault, had significantly higher levels of depression than female youth without such experiences. Implications of these findings are discussed.

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Introduction

Depression remains a significant mental health issue experienced by justice involved youth, a condition which is often related to other co-occurring mental health problems, such as PTSD, trauma and substance misuse. Depression and its often-associated negative outcomes [18,19,30] have been found to have long term, adverse mental health outcomes. In particular, Teplin and her associates [35] found among the Cook County, Illinois detained they studied those 15 years after detention, 52.3% of males and 30.9% of females still had a psychiatric disorder, and disorder prevalence rates that were higher than in the general population. Males were more likely to persist with a psychiatric disorder than females; and untreated traumas and other disorders made it harder to finish school, get a job, and stay out of jail. The study also found that males with depressive disorder at baseline were more likely than those without this disorder to have mood, anxiety, and alcohol use disorders 15 years later. Females with depressive disorders at baseline were more likely than those without to have nearly all disorders.

Depressed mood is also associated with several problem behaviors. A well-established correlation exists between depressed mood and conduct problems (e.g., conduct disorder and oppositional defiant disorder) during childhood and adolescence [2,5], which tends to become more prevalent during adolescence (e.g., Cohen P et al. 1993). Studies of youths involved in delinquency who enter the justice system have found high prevalence rates of depression and other mood disorders [1,33]. For example, Teplin, Abram, McClelland, et al. [32] found two-thirds of detained males and almost three-quarters of females met diagnostic criteria for one or more psychiatric disorders. Half of the males and females had a substance use disorder. Affective disorders were also prevalent, especially among females, with 20% meeting diagnostic criteria for a major depressive episode [32]. Other studies have identified similar prevalence of depressive symptoms and substance use disorders [12,26]. Related research on justice-involved youths has identified an association between depression and sexual risk behavior [33], sexual assault victimization and depression [9] and a comorbidity in marijuana use and depression [1,31]. Moreover, longitudinal studies suggest early problems with both depression and de-

linquency can lead to difficulties with school success, substance use, continued depression and criminal offending in adulthood [5,11,20,21]. Johnson, Esposito-Smythers, Miranda, et al. [17] note that while research has improved our knowledge of "disruptive behavior disorders among incarcerated youths, far less is known about the factors associated with depression and other internalizing symptoms in this population" (p. 1096).

Sex effects

It is also important to consider sex differences in the multiple problems often experienced by justice-involved youth. Females experience higher rates of psychiatric disorders, Sexually Transmitted Infections (STIs) and the consequential health effects of sexual assaults, than males [6-8,13-15,32,33]. On the other hand, males are more likely to be involved in substance use, and peer delinquency, than females [28]. The effectiveness of behavioral health services could be improved by greater insight into these gender specific relationships and the prevalence of subgroups of male and female youth reflecting different combinations or patterns of trauma and health risk behaviors.

Informed by the above noted research literature, the present study involving justice involved youth, addressed three research questions:

1. Does a similar factor structure exist for an eight-item depression construct among male and female youth?
2. What demographic, background and psychosocial factors relate to depression among the male and female youth?
3. How similar are the male and female predictive factors for depression?

Methods

Project setting: Juvenile Assessment Center (JAC) health coach services

Data were collected in an innovative, comprehensive health coach service for youths entering a Juvenile Assessment Center (JAC), a centralized intake facility located in a southeastern U.S. city. The data collection period ranged from 3/3/2024 to 8/30/2025. The service, which involves a collaboration with the county health department, has four major goals [7].

1. The service offers HIV and STD evidence-based risk reduction information and education to youths using gender-appropriate and developmentally appropriate curricula.
2. The service performs analysis of youth provided urine specimens to identify recent drug use (via the Enzyme Multiplied Immunoassay Technique [EMIT] procedure), STDs (Chlamydia and Gonorrhea via the Aptima testing procedure), and swab testing for HIV (only one HIV positive case was found, and that child was placed in treatment).
3. The service seeks to follow-up with STD and HIV positive youth, and promptly link them with appropriate treatment. Youth who screen high on a depression inventory [22,27] are also linked to follow-up services.

Health Coaches are trained to follow a detailed data collection and service delivery protocol, including Department of Health's STD and HIV pretest and posttest counseling. Data collection and entry are routinely monitored for integrity and quality by the program manager (a coauthor of this article). Data were collected in accordance with the requirements of the Institutional Review Board.

Participants

Participation in the health coach service for the present data collection period occurred from 3/3/2024 to 8/30/2025. Following informed consent, 206 girls and 489 boys received health coach services. Eighty-one (11.6%) of the 695 youths entered the JAC more than once (most often a second time), during which occasion(s) they received additional health coach services. Since a relatively small number and percent of youth received heath coach services more than once during the data collection time period, for youth with multiple entries, only health coach data collected during their first entry were used in the present study.

Participation in this service was voluntary. Florida public health law does not require youths 12 years and over to obtain parental consent for STD or HIV testing or treatment. No routinely available data were collected on youth who declined to participate [4] in health coach services.

Measures of depression

We used the eight-item version of the widely used 20-item Center for Epidemiological Studies Depression Scale [27], derived from the psychometric work of Melchior, Huba, Brown, et al. [4], to measure depression. The measure included the following 8 items:

(1) I felt I could not shake off the blues even with the help from my family and friends; (2) I felt sad, (3) I felt depressed, (4) I thought my life had been a failure, (5) I felt fearful, (6) My sleep was restless, (7) I felt lonely, and (8) I had crying spells. The time frame used for these experiences was the past week. Each item was scored as follows: 0 -- less than one day, 1-1 to 2 days, 2-3 to 4 days, and 3-5 to 7 days.

Covariate measures

Sociodemographic characteristics.

Birth gender: male=0, female=1; Age (in number of years, 11 to 17); Race: 0=Non-Black, 1=Black; Ethnicity: 0=non-Hispanic, 1=Hispanic.

Background experiences

Health coaches collected the following background information from youth receiving their services: Parents ever separated or divorced: 0=no, 1=yes; household member placed in jail or prison: 0=no, 1=yes.

Psychosocial factors

Each youth was asked if they had ever been sexually assaulted. Responses were coded as 0=no, 1=yes.

As noted above, youth provided urine samples which were tested for STDs and drug use. The STD tests probed for the presence of Gonorrhea or Chlamydia. Each variable was coded: 0=negative, 1=positive. Since only 10 youth (1.4%) tested positive for Gonorrhea, this variable was not included in our analyses. The Chlamydia test results were coded as 0=negative, 1=positive.

The youths' recent drug use was probed by EMIT urine testing for the following drugs:

Amphetamine, Buprenorphine, Benzodiazepine, Cocaine, Alcohol, Fentanyl, Methylenedioxyamphetamine, Methamphetamine, Opiates/Morphine, Methadone, Oxycodone, and Marijuana. Each test result was coded as: 0=negative, 1=positive.

Less than 2.8% of the youth tested positive for any drug other than marijuana (66.6%). Hence, only marijuana was included in our analyses.

Strategy of analysis

Descriptive data were analyzed using SPSS version 29.0.2.0 (IBM, 2023). Factor invariance and regression analyses were conducted using Mplus 8.11 [25]. The analyses proceeded in two major steps. First, we provide a descriptive summary of the variables involved in our analyses. Second, we conducted a male-female, multigroup Bayesian [10] regression analysis, involving scalar invariance [3] to assess the relationship between the sociodemographic, background experience, and psychosocial variables and youth depression.

Results

Descriptive statistics

Descriptive statistics for male and female youth demographic, background and psychosocial characteristics are shown in (Table 1). There were more boys (70.4% to 29.6%) than girls in the study. The majority of the boys and girls self-identified as African-American (70.8% and 67.5%, respectively). The boys and girls in this study averaged 15.4 and 15.0 years of age, respectively. A minority of both males and females were Hispanic (8.6% and 10.2% respectively.

In regard to background experiences, a large majority of both gender groups reported their parents had separated or divorced. Further, nearly 1 in 5 male and female youth reported a parent had spent time in jail or prison.

Psychosocial factors reflected gender group differences as well. Male youth had higher marijuana test positive rates, than females. On the other hand, females reported higher rates of being sexually assaulted and tested positive for Chlamydia at a higher rate than the males.

Table 1: Demographic characteristics and description of major variables.

	Male (n=485-489)	Female (n=193-206)
Age (Mean, SD)	15.45 (1.30)	15.09(1.44) **
Black	70.80%	67.50%
Hispanic	8.60%	10.20%
Parents separated/Divorced	18.60%	19.20%
Sexually assaulted	1.30%	16.80%**
Marijuana positive	71.10%	59.90%**
Chlamydia	8.40%	14.10%*
Depression Items		
Could not shake off blues	0.16(0.56)	0.31(0.77)***
Felt sad	0.38(0.79)	0.76(1.07)***
Felt depressed	0.25(0.72)	0.63(1.08)***
Thought my life a failure	0.21(0.65)	0.43(0.89)***
Felt fearful	0.12(0.46)	0.37(0.83)**
Sleep was restless	0.51(1.00)	0.64(1.04)
Felt lonely	0.29(0.76)	0.57(1.07)***
Had crying spells	0.17(0.54)	0.63(1.00) ***

Two-Tailed p-values: *p<.05; **p<..01; ***p< .001

Females reported significantly higher levels of depression on seven of the eight depression items, than the males. Importantly, 24.3% of female youth, compared to 10.2% of the males, had a depression score of 7 or higher, a designated threshold score indicative of potentially needing clinical intervention [4,29].

Male-female multigroup analysis

Measurement invariance analysis sought to identify whether the depression measure had the same meaning and statistical structure across the male and female youth groups [3,23]. Hence, we conducted a male-female multigroup regression analysis involving scalar invariance for the depression measure, and a regression of the depression measure on our sociodemographic, background experience, and psychosocial predictor variables. The results are shown in (Table 2).

Table 2: Multigroup model fit information.

Number of Free Parameters	49				
Bayesian Posterior Predictive Checking using Chi-Square	-35.565				
95% Confidence Interval for the Difference Between the Observed and the Replicated Chi-Square Values	81.726				
Posterior Predictive P-Value	0.220				
Potential Scale Reduction (PSR):	1.061				
Posterior Predictive P-Value (Confidence Limits) From Each Group					
Group 1 (0)	0.427 (-36.027, 43.907)				
Group 2 (1)	0.197 (-24.215, 63.666)				
Final Class Counts and Proportions for The Latent Classes Based on The Estimated Model					
Latent Classes					
1	447	0.70173			
2	190	0.29827			

MODEL RESULTS – MALES						
Variable	Estimate	Posterior S.D.	One-Tailed P-Value	95% C.I.		Significance
				Lower 2.5%	Upper 2.5%	
TOTDEPR by						
DEP1	1.000	0.000	0.000	1.000	1.000	
DEP2	1.263	0.192	0.000	0.932	1.714	*
DEP3	1.218	0.213	0.000	0.878	1.701	*
DEP4	0.981	0.158	0.000	0.705	1.326	*
DEP5	0.860	0.138	0.000	0.624	1.170	*
DEP6	0.533	0.079	0.000	0.391	0.696	*
DEP7	0.914	0.146	0.000	0.665	1.238	*
DEP8	0.768	0.111	0.000	0.574	1.010	*
TOTDEPR on						
ETHNIC	-0.097	0.355	0.390	-0.803	0.598	
RBLACK	-0.663	0.232	0.001	-1.150	-0.242	*
RAGE	-0.021	0.073	0.384	-0.167	0.121	
THC	-0.116	0.205	0.282	-0.527	0.285	
CHLAMYDIA	-0.452	0.372	0.102	-1.224	0.247	
SEXASSLT	0.617	0.725	0.190	-0.804	2.065	
SEPARATE/DIVORCE	-0.039	0.207	0.423	-0.449	0.371	
PARENT JAIL/PRISON	0.864	0.248	0.000	0.424	1.404	*
Intercepts						
TOTDEPR	-1.577	1.215	0.090	-4.070	0.719	
Thresholds						
DEP1$1	0.143	0.343	0.356	-0.542	0.750	
DEP1$2	0.706	0.346	0.015	0.050	1.342	*
DEP1$3	1.524	0.364	0.000	0.871	2.229	*
DEP2$1	-1.237	0.435	0.000	2.096	-0.498	*
DEP2$2	-0.203	0.428	0.337	-1.021	0.554	
DEP2$3	0.758	0.430	0.026	-0.004	1.556	
DEP3$1	-0.490	0.411	0.143	-1.222	0.265	
DEP3$2	0.023	0.409	0.482	-0.699	0.784	
DEP3$3	0.768	0.411	0.016	0.045	1.541	*
DEP4$1	-0.056	0.346	0.448	-0.708	0.536	
DEP4$2	0.495	0.343	0.091	-0.134	1.089	
DEP4$3	1.183	0.344	0.000	0.569	1.810	*
DEP5$1	0.262	0.297	0.209	-0.276	0.811	
DEP5$2	0.931	0.296	0.000	0.400	1.490	*
DEP5$3	1.528	0.312	0.000	0.970	2.130	*
DEP6$1	-0.244	0.192	0.109	-0.610	0.108	
DEP6$2	0.128	0.190	0.271	-0.229	0.476	
DEP6$3	0.590	0.192	0.000	0.233	0.943	*
DEP7$1	-0.202	0.319	0.284	-0.813	0.341	
DEP7$2	0.178	0.315	0.317	-0.412	0.731	
DEP7$3	0.795	0.315	0.003	0.188	1.352	*
DEP8$1	-0.110	0.259	0.351	-0.595	0.365	
DEP8$2	0.551	0.261	0.009	0.078	1.039	*
DEP8$3	1.180	0.274	0.000	0.706	1.712	*
Residual Variances						
TOTDEPR	2.221	0.594	0.000	1.429	3.721	*

MODEL RESULTS – FEMALES						
Variable	Estimate	Posterior S.D.	One-Tailed P-Value	95% C.I.		Significance
				Lower 2.5%	Upper 2.5%	
TOTDEPR by						
DEP1	1.000	0.000	0.000	1.000	1.000	
DEP2	1.263	0.192	0.000	0.932	1.714	*
DEP3	1.218	0.213	0.000	0.878	1.701	*
DEP4	0.981	0.158	0.000	0.705	1.326	*
DEP5	0.860	0.138	0.000	0.624	1.170	*
DEP6	0.533	0.079	0.000	0.391	0.696	*
DEP7	0.914	0.146	0.000	0.665	1.238	*
DEP8	0.768	0.111	0.000	0.574	1.010	*
TOTDEPR on						
ETHNIC	0.089	0.479	0.426	-0.856	1.035	
RBLACK	-0.082	0.317	0.396	-0.707	0.545	
RAGE	-0.137	0.037	0.000	-0.222	-0.075	*
THC	0.172	0.271	0.258	-0.355	0.713	
CHLAMYDIA	0.114	0.377	0.378	-0.624	0.861	
SEXASSLT	1.143	0.359	0.000	0.495	1.912	*
SEPARATE/DIVORCE	0.386	0.311	0.096	-0.193	1.032	
PARENT JAIL/PRISON	0.705	0.333	0.012	0.091	1.396	*
Intercepts						
TOTDEPR	0.000	0.000	1.000	0.000	0.000	
Thresholds						
DEP1$1	0.143	0.343	0.356	-0.542	0.750	
DEP1$2	0.706	0.346	0.015	0.050	1.342	*
DEP1$3	1.524	0.364	0.000	0.871	2.229	*
DEP2$1	-1.237	0.435	0.000	-2.096	-0.498	*
DEP2$2	-0.203	0.428	0.337	-1.021	0.554	
DEP2$3	0.758	0.430	0.026	-0.004	1.566	
DEP3$1	-0.490	0.411	0.143	-1.222	0.265	
DEP3$2	0.023	0.409	0.482	-0.699	0.784	
DEP3$3	0.768	0.411	0.016	0.045	1.541	*
DEP4$1	-0.056	0.346	0.448	-0.708	0.536	
DEP4$2	0.495	0.343	0.091	-0.134	1.089	
DEP4$3	1.183	0.344	0.000	0.569	1.810	*
DEP5$1	0.262	0.297	0.209	-0.276	0.811	
DEP5$2	0.931	0.296	0.000	0.400	1.490	*
DEP5$3	1.528	0.312	0.000	0.970	2.130	*
DEP6$1	-0.244	0.192	0.109	-0.610	0.108	
DEP6$2	0.128	0.190	0.271	-0.229	0.476	
DEP6$3	0.590	0.192	0.000	0.233	0.943	*
DEP7$1	-0.202	0.319	0.284	-0.813	0.341	
DEP7$2	0.178	0.315	0.317	-0.412	0.731	
DEP7$3	0.795	0.315	0.003	0.188	1.352	*
DEP8$1	-0.110	0.259	0.351	-0.595	0.365	
DEP8$2	0.551	0.261	0.009	0.078	1.039	*
DEP8$3	1.180	0.274	0.000	0.706	1.712	*
Residual Variances						
TOTDEPR	2.221	0.594	0.000	1.429	3.721	*

As (Table 2) shows, the depression model fit was excellent for both gender groups. The specified Bayesian regression models were run with an initial 40,000 iterations, followed by 80,000 iterations to confirm model convergence stability reflected in its Potential Scale Reduction (PSR) value. Excellent PSR values of 1.061 were found in the 40,000-iteration run and 1.041 in the 80,000-iteration run, respectively, reflecting an expected reduction in PSR value. Additional convergence assessment involved a review of Markov Chain Monte Carlo trace plots, tracking stability in the movement of the chain across the sampling algorithm [10]. The Bayesian measure of model fit, the Posterior Predictive P-value (PPP), was good for each regression model with PPP values of 0.220 and 0.231 for the 40K and 80K iteration runs, respectively.

Regression results indicate Black male youth reported significantly lower depression than nonBlack (mainly White) youth. On the other hand, male youth who reported a parent spent time in jail or prison reported significantly more depression, than male youth whose parents were not reported to have incarceration experience. For females, and similar to males, youth with parents who had incarceration experience reported significantly more depression than youth who did not report any parent incarceration. In addition, older age youth reported significantly lower depression than younger aged youth. Further, females who experienced being sexually assaulted reported a significantly higher level of depression, than those without such an experience.

Discussion/conclusion

In addition to confirming the psychometric soundness of the measure of depression we used in this study; regression analysis highlighted some significant predictors of depression that add to the literature on this topic. The results provide answers to the research questions informing this study.

Research Question #1: Does a similar factor structure exist for the eight-item depression construct among male and female youth? Multigroup analysis provided statistical evidence supporting the view that the depression measure we used was psychometrically sound and scalar invariant (same number of factors, same factor loadings and same threshold values across the male and female youth in the study).

Research Question #2: What demographic, background and psychosocial factors relate to depression among the male and female youth. As reported earlier, for both males and females, only two demographic factors related to the youths' depression scores. For youth in both gender groups, neither THC (marijuana) use nor STD test results for Chlamydia were significantly related to depression. On the other hand, for both gender groups, background factors (for males: parent jail or prison; females: being sexually assaulted, parent spending time in jail or prison) were significant predictors of higher depression scores.

Research Question #3: How similar are the male and female predictive factors for depression? The pattern of results points to the importance of considering background experiences in understanding justice involved youth depression, particularly at the point of entry into the justice system.

There were several significant gender effects in the correlates of depression we identified.

Specifically, for both males and females, youth whose parents experienced jail or prison had higher depression scores, than youth whose parent(s) did not have such experience. Further, females who reported being sexually assaulted reported significantly higher depression, than females not reporting this experience. Meta-analytic studies have identified family issues, such as incarceration, as being consistently related to youth antisocial behavior [24]. However, little is known about the dynamics or paths of causal influence of parental incarceration on their children's mental health. This represents an important area for further research.

The significant relationship between parent incarceration history and youth depression underscores the importance of further study of this relationship. Murray, Farrington, and Sekols' [24] meta-analytic review of 40 studies led them to recommend more rigorous studies on this important topic. In particular, criminal justice system reform may be needed to prevent the negative consequences of parental incarceration on their children. Such efforts are especially needed in the U.S., which is among the nations with the highest rates of incarceration in the world.

The lack of association between depression, marijuana use and STDs is particularly interesting. Importantly, as (Table 1) shows, males have a significantly higher positive rate for marijuana, than females; and females have a significantly higher Chlamydia positive rate than males. However, when we control for gender in our regression models, these relationships disappear. These findings underscore the importance of assessing gender specific effects in research studies involving depression among justice involved youth.

There are a number of strong points in the research reported in this paper. Among them are the use of biological tests of recent drug use and the existence of an STD (Chlamydia and/or Gonorrhea). These test results prevent the self-report bias often encountered in studies involving these issues among justice involved youth.

At the same time, there are several limitations to the research reported in this paper. First, the multigroup, multivariate analyses were conducted on cross-sectional data. Hence, no causal interpretations of our findings are possible. Second, the results of the study may not generalize to male and female youths arrested in other jurisdictions, reflecting different sociodemographic and contextual circumstances. Future research should conduct similar studies in other jurisdictions.

Our research underscores the importance of obtaining routine, comprehensive background information on justice involved male and female youth entering the justice system, which can provide a better understanding of their common and gender specific service needs. Such understanding can inform the development of more effective delivery of mental health and related services to the many troubled youth who enter the system.

Declarations

Acknowledgement: We are grateful for County Department of Health support for the STD and HIV testing material, laboratory testing, and ongoing training of Health Coaches.

Data availability: Data were collected in accordance with the requirements the Institutional Review Board, and deidentified for this study. These public health data are restricted to analysis by the identified senior author-researcher, reflected in a Memorandum of Agreement (MOA).

Conflicts of interest: The authors of this manuscript have no conflicts of interest to report.

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