Polysubstance Use and Social Sequelae in Women of Reproductive Age with Recent Marijuana Use

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BACKGROUND/OBJECTIVE

- Polysubstance use (PSU) is defined as the ingestion of more than one drug of abuse within a defined period with specific motivations driven by anticipated drug effect(s).

- Concomitant use of marijuana (MJ) with various classes of substances including opioids, psychoactive stimulants (cocaine, crack, methamphetamine), tobacco/cigarette or alcohol among women of reproductive age (WRA, 18-44 years old) may negatively impact the health and well-being of this population.

- Although several studies have examined the effects of MJ on psychosocial outcomes within the general population noting prevalence of PSU, no study has specifically assessed the association between PSU status that includes MJ and social sequelae in WRA.

- The purpose of this study was to (1) assess the prevalence of PSU in WRA who reported recent marijuana use; and (2) examine the association between PSU and social sequelae, including getting in trouble with the law, relationship difficulty with others, and lower achievement in job or educational settings, in this group of women.

METHODS

- A cross-sectional study design was used to analyze data from the 2015-2019 National Survey on Drug Use and Health (NSDUH).

- The sample included 11,895 adult WRA aged 18-44 years old who used MJ in the past month with four levels of PSU status.

- (1) Monosubstance marijuana users (MMU) refers to women involved only in monosubstance use of marijuana in the past month without use of other substances, including alcohol binge drinking, opioids, psychoactive stimulants, and tobacco/cigarette (reference group); (2) Polysubstance marijuana users I (PMU I) refers to women involved in polysubstance use of marijuana in the past month with one other substance (alcohol binge drinking, opioids, psychoactive stimulants, or tobacco/cigarette); (3) Polysubstance marijuana users II (PMU II) refers to women involved in polysubstance use of marijuana in the past month with two other substance (alcohol binge drinking, opioids, psychoactive stimulants, or tobacco/cigarette); and (4) Polysubstance marijuana users III (PMU III) refers to women involved in polysubstance use of marijuana in the past month with three or more substance (alcohol binge drinking, opioids, psychoactive stimulants, or tobacco/cigarette).

- Women's social sequelae was assessed based on the following three NSDUH yes/no questions: "During the past 12 months, did using marijuana or hashish cause you to have serious problems like this either at home, work, or school?", "During the past 12 months, did using marijuana or hashish cause you to do things that repeatedly got you in trouble with the law?", "During the past 12 months, did you have any problems with family or friends that were probably caused by your use of marijuana or hashish?".

- Based on the responses to the three questions, respondents were classified into two groups, namely 'yes social sequelae' group (presence of women's social sequelae caused by MJ) versus 'no social sequelae' group (absence of women's social sequelae caused by MJ).

- Descriptive analyses were conducted to describe the sample characteristics and assess the prevalence of PSU in WRA who reported recent marijuana use.

- Bivariate analyses using the chi-squared test were conducted between (1) social sequelae and PSU status; (2) PSU status and sociodemographic factors; and (3) social sequelae and sociodemographic factors

- A weighted logistic regression model was built to examine the association between PSU status and social sequelae in this group of women. The data were weighted to account for the complex design of the NSDUH; thus, all of the estimates in the study are US nationally representative estimates.

RESULTS

Table 1: Sample Characteristics of Women of Reproductive Age (18-44 years old) Who Used Marijuana in the Past Month Stratified by Polysubstance Use Status

Characteristics	Total N = 11,895 Weighted % (95% CI)	Monosubstance Marijuana Users (MMU)* N = 2,770 Weighted % (95% CI)	Polysubstance Marijuana Users I (PMU I)** N = 5,129 Weighted % (95% CI)	Polysubstance Marijuana Users II (PMU II)*** N = 3,142 Weighted % (95% CI)	Polysubstance Marijuana Users III (PMU III)**** N = 854 Weighted % (95% CI)	P-value
Social Sequelae (SS)						< 0.001
No	95.55 (95.02, 96.02)	96.19 (95.19, 96.98)	96.46 (95.87, 96.98)	95.04 (93.82, 96.03)	89.82 (86.55, 92.37)	
Yes	4.45 (3.98, 4.98)	3.81 (3.02, 4.81)	3.54 (3.02, 4.13)	4.96 (3.97, 6.18)	10.18 (7.63, 13.45)	
Age						0.0467
18-25 years	41.65 (40.65, 42.66)	42.54 (40.07, 45.05)	41.32 (39.72, 42.94)	40.09 (38.27, 41.94)	46.55 (42.21, 50.94)	
26-44 years	58.35 (57.34, 59.35)	57.46 (54.95, 59.93)	58.68 (57.06, 60.28)	59.91 (58.06, 61.73)	53.45 (49.06, 57.79)	
Race/Ethnicity						<0.001
White non-Hispanic	61.66 (60.14, 63.16)	53.51 (51.01, 55.99)	62.43 (60.20, 64.60)	64.41 (62.07, 66.69)	73.23 (68.94, 77.12)	
Black non-Hispanic	16.11 (15.08, 17.19)	22.13 (20.25, 24.12)	15.50 (14.10, 17.01)	14.44 (12.64, 16.45)	6.44 (4.55, 9.03)	
Asian/other non-Hispanic	7.87 (7.12, 8.70)	9.08 (7.62, 10.78)	7.57 (6.58, 8.68)	7.22 (5.89, 8.81)	8.26 (6.51, 10.44)	
Hispanic	15.28 (13.46, 15.31)	15.28 (13.74, 16.98)	14.50 (13.17, 15.95)	13.93 (12.59, 15.39)	12.07 (9.83, 14.74)	
Education						0.023
No high school	9.48 (8.84, 10.15)	8.47 (7.12, 9.83)	9.40 (8.40, 10.64)	10.19 (8.85, 11.71)	10.53 (8.01, 13.74)	
High school or GED	22.63 (21.47, 23.61)	21.45 (19.07, 24.03)	21.62 (19.95, 23.38)	25.36 (23.47, 27.35)	21.02 (18.14, 24.22)	
Some college/College graduate	67.99 (66.91, 69.06)	70.18 (67.92, 72.34)	68.92 (67.17, 70.63)	64.45 (62.45, 66.41)	68.45 (63.86, 72.70)	
Employment status						<0.001
Full-time	49.29 (48.22, 50.37)	48.08 (45.39, 50.78)	51.28 (49.83, 52.73)	47.90 (45.48, 50.33)	46.38 (42.06, 50.75)	
Part-time	21.89 (21.09, 22.70)	23.84 (21.77, 26.04)	21.34 (20.14, 22.58)	21.09 (19.33, 22.96)	21.80 (18.25, 25.83)	
Unemployed	7.77 (7.13, 8.46)	5.83 (4.93, 6.89)	6.88 (5.96, 7.97)	8.16 (8.20, 10.71)	13.46 (10.82, 16.61)	
Other	21.05 (20.01, 22.13)	22.25 (20.54, 24.06)	20.50 (18.98, 22.08)	21.66 (19.70, 23.74)	18.36 (15.56, 21.54)	
Health insurance gap in the past year						0.002
Yes	11.01 (10.15, 11.93)	10.86 (9.34, 12.58)	9.60 (8.61, 10.69)	12.38 (10.77, 14.18)	15.37 (11.67, 19.98)	
No	88.99 (88.07, 89.85)	89.14 (87.42, 90.66)	90.4 (89.31, 91.39)	87.62 (85.82, 89.23)	84.63 (80.02, 88.33)	
Past-year major depressive episode						<0.001
Yes	22.59 (21.63, 23.58)	21.76 (19.92, 23.73)	20.48 (19.22, 21.79)	24.93 (22.94, 27.03)	29.49 (25.45, 33.88)	
No	77.41 (76.42, 78.37)	78.24 (76.27, 80.08)	79.52 (78.21, 80.78)	75.07 (66.12, 74.55)	70.51 (66.12, 74.55)	
Self-reported overall health						<0.001
Excellent/Very good	56.13 (54.79, 57.46)	59.33 (56.59, 62.02)	58.06 (56.21, 59.88)	50.60 (48.22, 52.99)	54.61 (50.10, 59.05)	
Good	29.49 (28.23, 30.79)	27.45 (24.94, 30.12)	28.57 (26.82, 30.38)	33.33 (30.87, 35.89)	27.52 (23.51, 31.86)	
Fair/Poor	14.38 (13.51, 15.29)	13.22 (11.36, 15.35)	13.37 (12.08, 14.79)	16.07 (14.42, 17.86)	17.88 (14.60, 21.68)	

*MMU refers to women involved in monosubstance use of marijuana only in the past month without use of other substances (alcohol binge drinking, opioids, psychoactive stimulants, and tobacco)
**PMU I refers to women involved in polysubstance use of marijuana in the past month with one other substance (alcohol binge drinking, opioids, psychoactive stimulants, or tobacco)
***PMU II refers to women involved in polysubstance use of marijuana in the past month with two other substances (alcohol binge drinking, opioids, psychoactive stimulants, or tobacco)
****PMU III refers to women involved in polysubstance use of marijuana in the past month with three or more substances (alcohol binge drinking, opioids, psychoactive stimulants, or tobacco)

Table 2: Prevalence of Social Sequelae Among Women of Reproductive Age (18-44 years old) Who Used Marijuana in the Past Month

Characteristics	Social Sequelae (SS)		P-value
	No SS Weighted Prevalence (95% CI)	Yes SS Weighted Prevalence (95% CI)	
Age			< 0.001
18-25 years	92.26 (91.16, 93.24)	7.74 (6.76, 8.84)	
26-44 years	97.88 (97.29, 98.34)	2.12 (1.66, 2.71)	
Race/Ethnicity			0.002
White non-Hispanic	96.29 (95.76, 96.76)	3.71 (3.24, 4.24)	
Black non-Hispanic	94.23 (92.40, 95.64)	5.77 (4.36, 7.60)	
Asian/other non-Hispanic	94.40 (92.17, 96.02)	5.60 (3.98, 7.83)	
Hispanic	94.43 (92.99, 95.58)	5.57 (4.42, 7.01)	
Education			0.001
No high school	94.11 (92.46, 95.41)	5.89 (4.59, 7.54)	
High school or GED	94.29 (93.12, 95.27)	5.71 (4.72, 6.88)	
Some college/College graduate	96.16 (95.49, 96.74)	3.84 (3.26, 4.51)	
Employment status			< 0.001
Full-time	96.67 (96.00, 97.24)	3.33 (2.76, 4.00)	
Part-time	93.95 (92.74, 94.97)	6.05 (5.03, 7.26)	
Unemployed	91.18 (88.04, 93.55)	8.82 (6.45, 11.96)	
Other	96.17 (95.25, 96.92)	3.83 (3.08, 4.75)	
Health insurance gap in the past year			0.003
Yes	93.63 (91.68, 95.14)	6.37 (4.81, 8.32)	
No	95.72 (95.19, 96.19)	4.28 (3.81, 4.81)	
Past-year major depressive episode			< 0.001
Yes	92.64 (91.32, 93.78)	7.36 (6.22, 8.68)	
No	96.44 (95.91, 96.90)	3.56 (3.10, 4.09)	
Self-reported overall health			< 0.001
Excellent/Very good	96.55 (95.96, 97.05)	3.45 (2.95, 4.04)	
Good	94.32 (93.29, 95.20)	5.68 (4.80, 6.71)	
Fair/Poor	94.15 (92.65, 95.36)	5.85 (4.64, 7.35)	

Table 3: Associations Between Social Sequelae and Sample Characteristics in Women of Reproductive Age (18-44 years old) Who Used Marijuana in the Past Month Stratified by Polysubstance Use Status
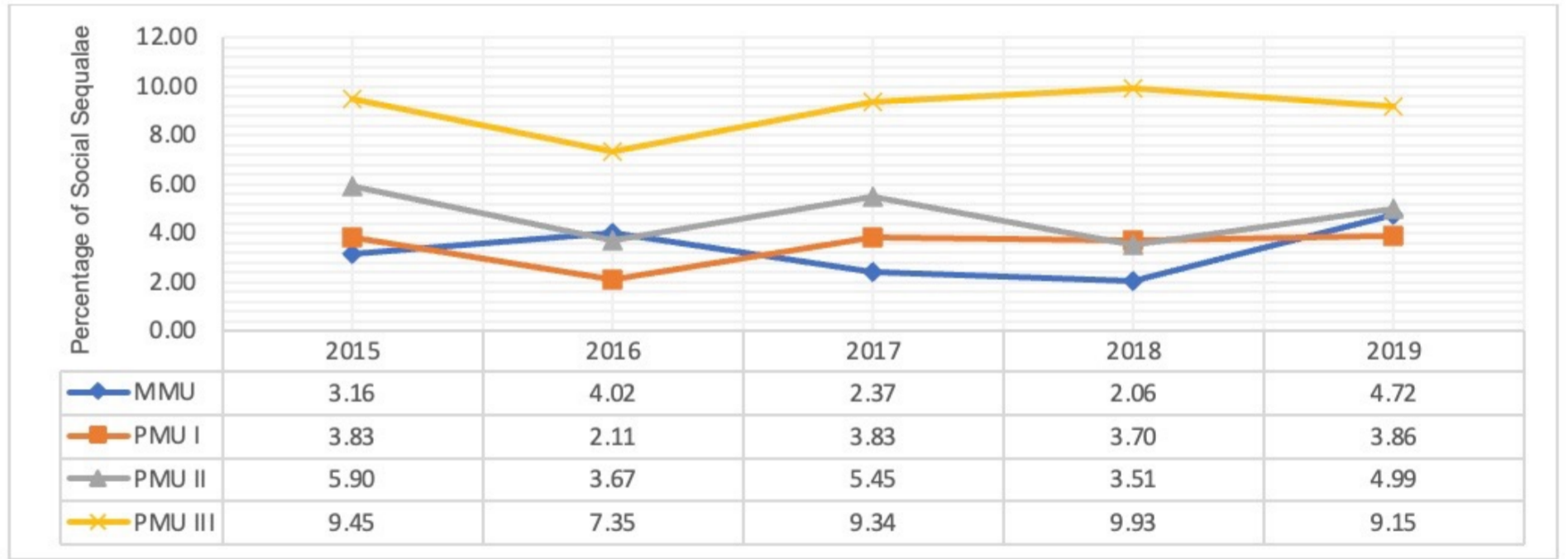
Characteristics	Social Sequelae Odds Ratio	Social Sequelae Odds Ratio (95% CI)	P-value
Polysubstance Use Status			
Monosubstance Marijuana Users (MMU)	Reference	Reference	
Polysubstance Marijuana Users I (PSU I)	1.12	(0.81, 1.56)	0.48
Polysubstance Marijuana Users II (PSU II)	1.68	(1.16, 2.43)	0.007
Polysubstance Marijuana Users III (PSU III)	3.18	(1.90, 5.31)	<0.001
Age			
18-25 years	3.75	(2.67, 5.26)	<0.001
26-44 years	Reference	Reference	
Race/Ethnicity			
White non-Hispanic	Reference	Reference	
Black non-Hispanic	1.76	(1.25, 2.50)	<0.001
Asian/other non-Hispanic	1.37	(0.88, 2.21)	0.16
Hispanic	1.29	(0.96, 1.74)	0.085
Education			
No high school	1.21	(0.84, 1.54)	0.31
High school or GED	1.19	(0.90, 1.59)	0.085
Some college/College graduate	Reference	Reference	
Employment status			
Full-time	Reference	Reference	
Part-time	1.60	(1.15, 2.23)	0.006
Unemployed	1.80	(1.22, 2.65)	0.004
Other	1.01	(0.72, 1.44)	0.93
Health insurance gap in the past year			
Yes	1.43	(1.07, 1.90)	0.016
No	Reference	Reference	
Past-year major depressive episode			
Yes	1.97	(1.52, 2.55)	<0.001
No	Reference	Reference	
Self-reported overall health			
Excellent/Very good	Reference	Reference	
Good	1.69	(1.32, 2.16)	<0.001
Fair/Poor	1.62	(1.14, 2.29)	0.008

*p-value < 0.05

- **Table 1:** Nearly 4.5% (95% CI: 3.98, 4.98) of the past month MJ women users in reproductive age experienced social sequelae.
- There was a notable increasing trend in the prevalence of social sequelae with PSU that included other substances such as alcohol binge drinking, opioids, psychoactive stimulants, or tobacco/cigarette.
- The prevalence of social sequelae among monosubstance marijuana users (MMU) was 3.8% (95% CI: 3.02, 4.81).
- Women involved in PSU with two forms of substance with MJ (PMU II) had higher prevalence (5.0%, 95% CI: 3.94, 6.18) of social sequelae while women involved in PSU with three or more forms of substance with MJ had the highest prevalence (10.2%, 95% CI: 7.63, 13.45) of social sequelae.
- The majority of WRA were White non-Hispanic (61.7%), had attained some college education or were college graduate (68.0%), did not have any health insurance gap in the past year (89.0%), and were in the age group between 25-49 years old (58.4%).
- Nearly 22.6% (95% CI: 21.63, 23.56) of the women who used MJ in the past month experienced major depressive episode (MDE) in the past year.
- However, women involved in PSU with two forms of substance with MJ (PMU II) had higher prevalence (24.9%, 95% CI: 22.94, 27.03) of MDE while women involved in PSU with three or more forms of substance with MJ had the highest prevalence (29.5%, 95% CI: 25.45, 33.88) of MDE.
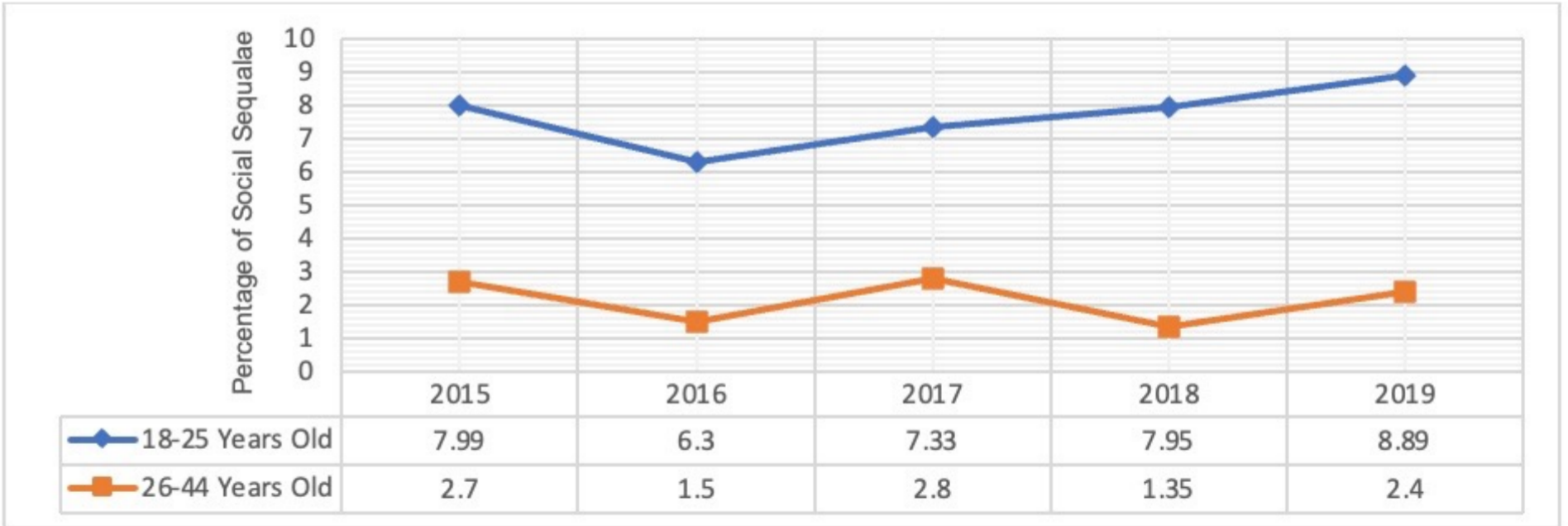
- **Table 2:** A significantly higher proportion of women aged 18-25 years old (7.7%, 95% CI: 6.76, 8.84) had experienced social sequelae than women aged 26-44 years old (2.1%, 95% CI: 1.66, 2.71) with p-value < 0.001.
- Women with some college or college graduate (3.8%, 95% CI: 3.26, 4.51), those with full-time employment (3.3%, 95% CI: 2.76, 4.00), women without any health insurance gap (4.3%, 95% CI: 3.81, 4.81), women without past year MDE (3.6%, 95% CI: 3.10, 4.09), and women with excellent/very good self-reported health (3.5%, 95% CI: 2.95, 4.04) had the lowest likelihood of experiencing social sequelae (p-value < 0.001).

Figure 1: Yearly Trend of Social Sequelae in Women of Reproductive Age (18-44 years old) by Polysubstance Use Status

	2015	2016	2017	2018	2019
MMU	3.16	4.02	2.37	2.06	4.72
PMU I	3.83	2.11	3.83	3.70	3.86
PMU II	5.90	3.67	5.45	3.51	4.99
PMU III	9.45	7.35	9.34	9.93	9.15

- **Figure 1:** The yearly trend of social sequelae over the past five years from 2015 to 2019 shows consistent results that women involved in PSU with three or more forms of substance with MJ (PMU III) had the highest prevalence of social sequelae from 7.35% to 9.93%.

Figure 2: Yearly Trend of Social Sequelae in Women of Reproductive Age (18-44 years old) by Age

	2015	2016	2017	2018	2019
18-25 Years Old	7.99	6.3	7.33	7.95	8.89
26-44 Years Old	2.7	1.5	2.8	1.35	2.4

- **Figure 2:** The yearly trend of social sequelae over the past five years from 2015 to 2019 shows consistent results that younger women MJ users aged 18-25 years old had a higher prevalence of social sequelae (6.30% to 8.89%) relative to older women MJ users aged 26-44 years old (1.35% to 2.7%)

- **Table 3:** MJ users involved in PSU with two forms of substance (PMU II) had higher odds of social sequelae by 68% (AOR=1.68, 95% CI: 1.16, 2.43) than women who only used MJ in the past month (MMU).
- MJ users involved in PSU with three or more forms of substance (PMU III) had 3.18 higher odds (AOR=3.18, 95% CI: 1.90, 5.31) of social sequelae than monosubstance marijuana users (MMU).
- Women aged 18-25 years old had 3.75 times the odds (AOR=3.75, 95% CI: 2.67, 5.26) of social sequelae relative to women aged 26-44 years after adjusting for PSU status, sociodemographic factors, past-year MDE, and self-reported overall health.
- Women who experienced MDE in the past 12 months had 1.95 times the odds (AOR=1.95, 95% CI: 1.52, 2.55) of social sequelae relative to women who did not have any MDE after adjusting for PSU status, sociodemographic factors, and self-reported overall health.

CONCLUSION

- Concurrent use of multiple substances significantly increased the odds of social sequelae among women marijuana users.
- Healthcare professionals and public health officials need to enhance awareness of PSU harm among WRA especially as it pertains to social sequelae.