

RELATIONSHIP BETWEEN METHAMPHETAMINE USE AND RISKY SEXUAL BEHAVIOR IN ADOLESCENTS

Cheng-Fang Yen

Department of Psychiatry and Graduate Institute of Behavioral Science,
Kaohsiung Medical University, Kaohsiung, Taiwan.

Substance abuse and risky sexual behavior have been identified as behaviors that can endanger adolescent psychosocial development. This study examined the relationship between methamphetamine (MAMP) use and risky sexual behavior in adolescents. Risky sexual behavior was compared not only between MAMP users and non-users, but also between high-frequency and low-frequency MAMP users. We compared the sexual intercourse histories of 85 adolescents formally charged as MAMP users with those of 170 gender-matched adolescents with no record of MAMP use. MAMP usage characteristics were compared between users who had and those who had not experienced sexual intercourse. Previous sexual experience was more likely in MAMP users than in non-users. MAMP users were also more likely to have had a greater total number of sexual partners and were more likely to have had unplanned sex under the influence of alcohol. High-frequency MAMP use was associated with increased tendencies to engage in unprotected sex and to use MAMP before sexual intercourse. In general, the chance of sexual intercourse increased in proportion to frequency of MAMP use. Given the clear link between MAMP use and risky sexual behavior, risk-reduction programs directed at teen MAMP users are urgently needed.

Key Words: adolescents, methamphetamine, risky sexual behavior, substance abuse
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Adolescents are prone to sexual behavior that places them at increased risk of unintended pregnancy and exposure to sexually transmitted diseases (STDs). Taiwan's rapid economic development in recent decades has been accompanied by changes in the sexual activity profile of Taiwanese adolescents, including a younger average age at first experience of sexual intercourse (Lin, Bureau of Health Promotion, unpublished data, 2002), a lower likelihood of using a condom during sexual intercourse [1], and a continually rising rate of HIV infection [2]. As in other developed countries, reducing risky sexual behavior among adolescents is a major focus of Taiwan's health promotion policy.

Risky sexual behavior and substance abuse have been identified as behaviors that can endanger adolescent psychosocial development [3]. Previous studies have indicated that adolescents who use cigarette tobacco [4], alcohol [5], marijuana [6], or cocaine [7] are more likely to engage in risky sexual behavior. However, little is currently known about the relationship between methamphetamine (MAMP) use and risky sexual behavior among adolescents. MAMP use is a major public health concern in the Asia Pacific region [8]. In Taiwan, both government criminal statistics [9] and national trend surveys [10] demonstrate that the level of MAMP use among adolescents is an issue that must be placed high on the nation's agenda of social concerns. Determining the relationship between risky sexual behavior and MAMP use would assist in the formulation of strategies aimed at improving adolescent health.

This study examined the relationship between MAMP use and risky sexual behavior among adolescents. Variables considered included age at first experience of sexual

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Address correspondence and reprint requests to: Dr. Cheng-Fang Yen, Department of Psychiatry, Kaohsiung Medical University, 100 Tzyou 1st Road, Kaohsiung 807, Taiwan.
E-mail: chfaye@cc.kmu.edu.tw

intercourse, current level of sexual activity, condom use habits, numbers of sexual partners, and frequency of unplanned sex while under the influence of MAMP or alcohol. Risky sexual behavior was compared not only between MAMP users and non-users, but also between high-frequency and low-frequency MAMP users.

METHODS

Sample

In Taiwan, adolescents arrested for MAMP use are required to participate in a 3- to 4-week detoxification program at their detention centers. Psychiatrists participate in the evaluation and treatment process. Between September 2001 and March 2002, 85 adolescent MAMP users (55 males and 30 females) were recruited from a juvenile detention center in southern Taiwan to participate in this survey. Each participant's MAMP use was confirmed by a positive result on a standard urine test. Individuals unable to understand interview questions (e.g. mentally handicapped subjects) were not included. An equal gender ratio of adolescents (110 males and 60 females, making a total of 170 subjects) was selected from a senior high school and a vocational school to serve as the control group. All subjects in the control group asserted that they had never used MAMP. These assertions were verified by their teachers. Informed consent was obtained from all subjects prior to interviews. Demographic data on adolescent MAMP users and non-users and characteristics of MAMP use are shown in Table 1.

Evaluation of sexual behavior

All subjects were initially screened regarding their sexual experience. Those who had had sexual intercourse were asked questions on characteristics of sexual behavior

considered to increase the risk of exposure to STDs and unintended pregnancy [7,11–17]. Each respondent provided the following information: age at first experience of sexual intercourse, total number of sexual partners, frequency of sexual intercourse during the most recent 1-month period, frequency of unprotected sex, frequency of unplanned sex under the influence of MAMP or alcohol, previous experience of sexual intercourse with a partner under the influence of MAMP or alcohol, previous experience of sexual intercourse immediately after MAMP use, and opinions regarding the aphrodisiac qualities of MAMP. Kendall's tau-b correlation coefficients of 1-week test-retest reliability of items in the sexual behavior questionnaire ranged from 0.655 to 0.955 (p from < 0.001 to 0.011). Due to the low level of literacy among adolescent MAMP users, research assistants read all the questions to the subjects to maximize comprehension and reliability. Control group respondents (MAMP non-users) completed the questionnaire on their own after receiving instructions from the research assistants.

The relationship between sexual behavior and MAMP use was examined in three different respondent group configurations in order to make the following comparisons of: sexual behavior between MAMP users and non-users with previous sexual intercourse experience, MAMP usage characteristics between MAMP users with and without previous sexual intercourse experience, and the sexual behavior of high-frequency and low-frequency MAMP users. High-frequency use was defined as an average MAMP use of at least once per week. Low-frequency use was defined as an average MAMP use of less than once per week.

Statistical analysis

We first compiled the ratio of respondents with sexual experience in MAMP user and non-user groups. Chi-

Table 1. Demographic data and characteristics of methamphetamine (MAMP) use

	MAMP users (N = 85)			MAMP non-users (N = 170)		
	n (%)	Mean \pm SD	Range	n (%)	Mean \pm SD	Range
Gender: male	55 (64.7)			110 (64.7)		
Age, yr		17.0 \pm 1.0	15–19		17.1 \pm 0.7	15–19
Education, yr		8.3 \pm 1.5	4–12		11.0 \pm 0.8	9.5–11.5
Age at initial MAMP use, yr		17.0 \pm 1.0	12–19		–	–
Expenditure on MAMP (NT\$/month)		2,228.7 \pm 5,494.6	0–33,750		–	–
Frequency of MAMP use (per month)		14.3 \pm 20.0	0.1–90		–	–

SD = standard deviation.

squared, Fisher's exact, and Mann-Whitney tests were used to analyze the differences in sexual behavior and MAMP usage characteristics. A *p* value of less than 0.05 was considered statistically significant.

RESULTS

More MAMP users (68 subjects, 80.0%) than non-users (19 subjects, 11.2%) reported previous sexual experience ($\chi^2 = 119.4, p < 0.001$). A comparison of sexual behavior characteristics between MAMP users and non-users with sexual experience showed that MAMP users had experienced sex with more partners than non-users (Z value of Mann-Whitney test = $-3.065, p = 0.002$) and had unplanned sex under the influence of alcohol more frequently ($\chi^2 = 7.033, p = 0.008$) than non-users (Table 2). Otherwise, no significant differences in sexual behavior were identified between these two groups.

MAMP usage characteristics were compared between MAMP users with and without sexual experience (Table 3). The frequency of MAMP use among those with sexual experience was higher than that among MAMP users without (Z value of Mann-Whitney test = $-2.037, p = 0.042$). However, the two groups showed no significant difference in terms of gender, age at initial MAMP use, or money spent to support their MAMP habit.

The characteristics of sexual behavior were compared between high-frequency and low-frequency MAMP users (Table 4). Respondents with high-frequency MAMP use had a greater number of sexual partners (Z value of Mann-Whitney test = $-2.196, p = 0.026$). The proportion of respondents who had engaged in unprotected sex ($\chi^2 = 7.027, p = 0.008$) and used MAMP before sexual intercourse ($\chi^2 = 7.601, p = 0.006$) was higher in high-frequency users than in low-frequency users. No other significant differences between the two groups in terms of sexual behavior characteristics were noted.

Table 2. Characteristics of sexual behavior in adolescent methamphetamine (MAMP) users and non-users who had had sexual intercourse

	MAMP users (N = 68)		MAMP non-users (N = 19)		χ^2	Z*	p
	n (%)	Mean \pm SD	n (%)	Mean \pm SD			
Age at first sexual intercourse, yr		15.0 \pm 2.1		15.7 \pm 1.3		-1.394	0.163
Total number of sexual partners		3.7 \pm 2.8		2.0 \pm 1.5		-3.065	0.002
Frequency of sexual intercourse (per month)		4.5 \pm 4.9		3.5 \pm 3.8		-1.111	0.266
Gender: male	45 (66.2)		13 (68.4)		0.034		0.854
Had engaged in unprotected sex	54 (79.4)		17 (89.5)		-		0.505 [†]
Had engaged in unplanned sex under the influence of alcohol	25 (36.8)		1 (5.3)		7.033		0.008
Had engaged in sexual intercourse with an alcohol-intoxicated partner	22 (32.4)		2 (10.5)		3.542		0.060

*Mann-Whitney test; [†]Fisher's exact test. SD = standard deviation.

Table 3. Characteristics of methamphetamine (MAMP) use in adolescent MAMP users with and without sexual experience

	Previous sexual intercourse (N = 68)		No previous sexual intercourse (N = 17)		χ^2	Z*	p
	n (%)	Mean \pm SD	n (%)	Mean \pm SD			
Gender: male	45 (66.2)		10 (58.8)		0.322		0.570
Age at initial MAMP use, yr		15.6 \pm 1.6		15.4 \pm 1.4		-0.691	0.489
Expenditure on MAMP (NT\$/month)		2,376.9 \pm 5,459.1		1,566.7 \pm 5,796.8		-1.939	0.053
Frequency of MAMP use (per month)		15.8 \pm 21.3		7.4 \pm 10.0		-2.037	0.042

*Mann-Whitney test. SD = standard deviation.

Table 4. Characteristics of sexual behavior in adolescents grouped by frequency of methamphetamine (MAMP) use

	High-frequency MAMP users (N = 36)		Low-frequency MAMP users (N = 32)		χ^2	Z*	p
	n (%)	Mean \pm SD	n (%)	Mean \pm SD			
Age at first sexual intercourse, yr		14.8 \pm 1.9		15.3 \pm 2.2		-1.331	0.183
Total number of sexual partners		4.3 \pm 2.9		3.1 \pm 2.6		-2.196	0.026
Frequency of sexual intercourse (per month)		6.0 \pm 1.0		2.9 \pm 0.5		-1.242	0.214
Gender: male	26 (72.2)		19 (59.4)		1.249		0.264
Had engaged in unprotected sex	33 (91.7)		21 (65.6)		7.027		0.008
Had sexual intercourse immediately after using MAMP	12 (33.3)		2 (6.3)		7.601		0.006
Belief that MAMP can enhance sexual performance	8 (22.2)		5 (15.6)		0.477		0.490
Had unplanned sex under the influence of MAMP	4 (11.1)		2 (6.3)		-		0.676 [†]
Had sex with a partner who was under the influence of MAMP	11 (30.6)		7 (21.9)		0.656		0.418
Had unplanned sex under the influence of alcohol	15 (41.7)		10 (31.3)		0.791		0.374
Had sexual intercourse with an alcohol-intoxicated partner	9 (25.0)		13 (40.6)		1.890		0.169

*Mann-Whitney test; [†]Fisher's exact test. SD = standard deviation.

DISCUSSION

Our study supports the argument that MAMP users are more likely to have a significantly greater number of sexual partners than non-users. Having multiple sexual partners increases the risk of STD due to random exposure, and probably represents partner selection behavior that tends toward high STD-risk individuals [11]. We further found that MAMP users were significantly more likely than non-users to engage in unplanned sex under the influence of alcohol. A previous study has shown that alcohol consumption is prevalent among adolescent MAMP users, with 26% of a surveyed population identified as having an alcohol use disorder [18]. Using event analysis, previous studies have shown a positive relationship between alcohol and risky sex in first-time sexual encounters [5]. Given the clear link between MAMP use and risky sexual behavior, risk-reduction programs directed at teen MAMP users are urgently needed.

Our study identified a significant relationship between high-frequency MAMP use and sex with multiple partners, unprotected sexual activity, and MAMP use prior to sexual intercourse. These results were consistent with previous studies in which a cluster of risky sexual behaviors were associated with increased consumption of alcohol and

tobacco as well as increased use of marijuana and other illicit drugs [12,19,20]. Frequency of substance abuse should be considered during development of programs aimed at reducing risky sexual behavior.

A possible explanation for the positive relationship between substance use and risky sexual behavior is the commonly held belief that consumption of certain substances enhances sexual performance [21]. In the present study, 19.1% of MAMP users believed that using MAMP could enhance sexual performance. However, the percentage of high-frequency and low-frequency MAMP users holding this belief was approximately the same.

While the cross-sectional nature of this study limits our ability to determine a clear causal relationship between MAMP use and risky sexual behavior, the covariation of substance use and risky sexual behavior may be due to an underlying psychosocial unconventionality and tendency to transgress social norms [22]. They both represent elements of a lifestyle that has significant elements of health risk [11]. Programs designed to prevent STDs and pregnancy among adolescents should address MAMP use as well as risky sexual behavior.

Our results must be interpreted in the light of several limitations. First, the mean number of years of education among MAMP users was lower than that among non-

MAMP users. Adolescents who leave school early might be exposed to a more complicated social environment, which might increase the likelihood of engaging in risky sexual behavior. Second, although mentally handicapped subjects were excluded from the case group, some factors that may affect the relationship between MAMP use and risky sexual behavior remain unmeasured. For example, previous studies have found that adolescents diagnosed with mood disorders are more likely to engage in risky sexual behavior [23–25]. Third, although subjects in the control group self-reported that they had never used MAMP and their teachers confirmed the accuracy of their statements, urine tests were not used to confirm their non-use of MAMP.

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青少年吸食安非他命和危險性行為之間的關聯

顏正芳

高雄醫學大學精神科暨行為科學研究所

物質濫用和危險性行為皆會危及青少年的心理健康發展，本研究比較有無吸食安非他命的青少年之間危險性行為的差別，以及不同安非他命吸食頻率的青少年之間危險性行為的差別，來了解青少年吸食安非他命和危險性行為之間的關聯性。本研究採個案對照研究設計，個案組為 85 位因吸食安非他命接受觀察勒戒的青少年，對照組則為 170 位以性別和個案組配對、未曾使用安非他命的社區青少年。研究首先調查所有青少年過往性行為經驗，對於曾有性行為者，進行個案組和對照組之間、以及不同安非他命吸食頻率者之間各項危險性行為的比較，並對於個案組中已有和尚未曾有性行為的青少年進行安非他命吸食特徵的比較。研究結果發現：個案組比對照組青少年有較高比例具有性行為經驗；個案組青少年具有較多的性交對象，並且較容易在酒精影響下發生非預期的性行為；吸食安非他命頻率較高的青少年比吸食頻率低者有較多性交對象、較易發生非預期的性行為、較常在性交前吸食安非他命；個案組中已有性行為的青少年比尚未有性行為者具有較高的安非他命吸食頻率。由本研究結果可知：青少年吸食安非他命和危險性行為之間具有顯著的關聯性，極有必要針對吸食安非他命的青少年進行降低危險性行為發生的介入策略，以減少不良後果的發生。

關鍵詞：青少年；安非他命；危險性行為；物質濫用

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抽印本索取處：顏正芳醫師
高雄醫學大學精神科
高雄市三民區自由一路 100 號