

Prevalence, Patterns, and Correlates of Voluntary Flunitrazepam Use

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ABSTRACT. *Objective.* To determine prevalence, patterns, and correlates of voluntary flunitrazepam use in a sample of sexually active adolescent and young adult women 14 to 26 years of age.

Design. Cross-sectional survey.

Setting. University-based ambulatory reproductive health clinics.

Patients or Other Participants. There were 904 women self-identified as white, African-American, or Mexican-American.

Interventions. None.

Main Outcome Measure. Lifetime, frequency, patterns, and physical effects of flunitrazepam use.

Results. Lifetime use was reported by 5.9% ($n = 53$) of subjects, with frequency of use ranging from 1 to 40 times. Flunitrazepam was taken most often with alcohol (74%), and 49% took this substance with other illicit drugs. Logistic regression analyses controlling for age and race/ethnicity found that users were significantly more likely than were nonusers to report lifetime use of marijuana (odds ratio [OR] = 3.6) or LSD (OR = 5.2), having a peer or partner who used flunitrazepam (OR = 21.7), pressure to use flunitrazepam when out with friends (OR = 2.7), and a mother who had at least a high school education (OR = 2.6). Finally, 10% of voluntary users reported experiencing subsequent physical or sexual victimization.

Conclusions. Voluntary use of flunitrazepam is becoming a health concern to sexually active young women who reside in the southwestern United States. Young women who have used LSD or marijuana in the past or who have a peer or partner who used this drug appear to be at the greatest risk. *Pediatrics* 1999;103(1). URL: <http://www.pediatrics.org/cgi/content/full/103/1/e6>; *flunitrazepam, adolescents, drug use, risk factors, patterns, prevalence.*

Flunitrazepam, otherwise known as “rophies, R-2, or roaches,” is fast becoming a popular drug of abuse in states close to Mexico, where it is manufactured.¹ In Texas alone, the number of pills seized by drug enforcement officials has risen from 194 in 1992 to >57 000 in 1996.¹ This inexpensive sedative is 10 times more potent than Valium and has been reported to remove all inhibitions and leave no hangover. It is more popular than alcohol or marijuana among some youths.^{1,2} Recently, this new drug has become increasingly popular among teens and young adults because it causes a euphoric,

drunken-like high and heightens the effect of alcohol and other drugs.¹⁻⁴ Although lethal overdoses of flunitrazepam are unlikely when it is taken alone, this drug can cause respiratory depression and death when combined with alcohol or other illicit drugs.² Moreover, regular use of flunitrazepam can cause physical and psychologic dependence.^{3,4}

Media reports suggest its most common pattern of use is as an “alcohol extender” and disinhibitory agent, used most often with beer.³ Furthermore, this small, white pill, which dissolves easily in liquids and is odorless, colorless, and tasteless, has become a favorite tool of predators who spike the drinks of unsuspecting young women and then rape them.²⁻⁵ According to media reports, women who have ingested flunitrazepam have reported passing out and later awakening briefly to find they are being sexually assaulted in their incapacitated state.^{3,5}

Although little data are available describing trends in flunitrazepam use, many law enforcement agencies predict that it will soon become the most popular drug of abuse among adolescents and young adults.⁴ In fact, the Office of National Drug Control Policy has reported that adolescents purchase this drug preferentially because it is cheaper than alcohol, its possession usually does not lead to criminal prosecution, and it is not detectable with standard serum or urine drug-screening methods.⁴ Texas youth are at particular risk for flunitrazepam use because of proximity to Mexican border towns where the drug can sell for <\$1 per pill.^{6,7} Despite evidence that flunitrazepam’s popularity is increasing, little evidence of self-reported prevalence or information about its frequency of use is available. The purpose of this report was to examine systematically the reported prevalence, patterns, and correlates of flunitrazepam use in a sexually active population of female adolescents and young adults who presented to community-based family planning clinics in southeast Texas. Sexually active young women were selected for study because they may be at higher risk because of the link between high-risk sexual behaviors (early sexual debut and multiple partners) and illicit drug use.⁸⁻¹⁰

METHODS

Sexually active women 14 to 26 years of age who presented to one of two community-based family planning clinics (Galveston, Angleton) operated by the Department of Obstetrics and Gynecology at The University of Texas Medical Branch at Galveston and who self-identified their race/ethnicity as white, African-American, or Mexican-American; were not currently pregnant or within 6 weeks’ postpartum; and who did not demonstrate an obvious cognitive/mental impairment were eligible to participate

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in the study. Although we attempted to recruit subjects consecutively, it is likely that some eligible women were missed because of clinic traffic patterns or scheduling. A total of 990 young women were approached during the study period. Fifty-four patients (5%) refused to participate because of time constraints, and 32 subjects agreed to participate, but did not complete the entire questionnaire. Thus, a total of 904 women completed the survey. The only difference noted between those who completed and those who either refused or did not finish the questionnaire was Spanish language. Therefore, our results may not be representative of primarily Spanish-speaking young women who presented to these family planning clinics.

With institutional review board approval, a bilingual research assistant approached subjects in the clinic waiting area. The project was presented to subjects as a study of health behaviors and drug use among adolescents and young adult women. The research assistant outlined study requirements and eligibility criteria in Spanish or English. After informed oral consent was obtained, the research assistant oriented each subject to the customized questionnaire, reviewed instructions to each section, and provided examples of the correct way to complete the bubble sheets so that these data could be scanned electronically. Each subject then completed the self-administered questionnaire in English or Spanish. To ensure anonymity, subjects were instructed to avoid placing identifying information on the completed questionnaire. Opportunities to clarify instructions and ask questions about the research instrument were provided. Participants received \$5 as compensation for their time and effort. Each subject was given a handout that provided information about drug and alcohol abuse and about agencies that provide services for drug dependence and sexual assault (because of the link between flunitrazepam use and sexual assault).

The self-report measure was customized on scannable computer sheets after we completed pilot testing ($n = 25$) to ensure readability, ease of understanding, and completion time. To ensure an accurate Spanish translation, the questionnaire was translated first into Spanish by the bilingual research assistant and then translated back into English by a second bilingual research assistant not associated with the project. The final 12-page measure was divided into sections. The demographic and reproductive health section elicited information on the subject's age, parental education and employment status, race/ethnicity, current living arrangements, school enrollment and performance, last grade completed, age at menarche, parity, gravidity, number of spontaneous or elective abortions, and age at first sexual activity. In addition, two questions assessed the lifetime occurrence of physical or sexual victimization.

Lifetime frequency of substance use was assessed in a manner consistent with other measures commonly used to assess drug and alcohol use in adolescents. This section was preceded by definitions and common street names for each drug assessed. Subjects were asked to indicate the number of times in their lifetime (0 to 40 or more) that they had used alcohol, marijuana, LSD, flunitrazepam, and other illicit drugs. Additional questions about flunitrazepam use included age at first use, sources of information about this drug, peer or partner flunitrazepam use, pressure to use this drug, physical effects of use, and whether flunitrazepam was taken along with alcohol or other drugs. Subjects were asked to rate on a four-point scale their ability to resist using flunitrazepam due to peer pressure. The social context of flunitrazepam use was evaluated by asking a series of questions on where, when, and with whom subjects used this drug. In addition, a 10-item true/false scale examined knowledge and effects of this drug. Items included pill appearance, taste, cost, how it was used, and the effects that it produces. Using a Likert scale, we assessed the perceived risk of harm to people (no risk, slight, moderate, and great) for experimental and regular use, as well as disapproval (do not disapprove, disapprove, and strongly disapprove) of peers who use this drug experimentally or regularly.

Data Definitions

Lifetime use of flunitrazepam, alcohol, marijuana, or LSD was affirmed if the subject reported using each drug one or more times. Perceived risk of harm associated with flunitrazepam use was dichotomized into no or slight risk (coded 0) or moderate to great risk (coded 1). Disapproval of experimental or regular use also was recoded as either present or absent. General knowledge

about flunitrazepam was obtained by summing correct responses to the 10-item scale. Scores ranged from 0 to 10, with a mean of 6.8 and a standard deviation of 1.7. Poor school performance was defined as getting mostly Cs or lower. Employed head of household was affirmed if the subject indicated that the person who paid the house rent or mortgage worked full- or part-time. Finally, peer or partner use of flunitrazepam was collapsed into one variable for the multivariate analyses because few partners reported using this drug.

Statistical Plan and Analysis

All surveys were scanned electronically into a computerized database; missing data from 20% of the surveys were evaluated for accuracy. We compared demographic and reproductive characteristics, substance use behaviors, general knowledge of flunitrazepam, perceived risk of harm, and disapproval of flunitrazepam use between users and nonusers using χ^2 or Student's t tests, depending on the level of measurement. Stepwise logistic regression analyses using likelihood ratio tests were conducted to identify correlates of lifetime flunitrazepam use. Variables significant at the $P < .10$ level were considered for entry into the logistic regression, and multicollinearity among significant variables was assessed. All data were analyzed using SPSS for Windows 95.¹¹

RESULTS

Of the 904 women who completed the self-report measure, 53 (5.9%) admitted using flunitrazepam one or more times. The mean age of users was 18.9 ± 3.2 years, whereas the mean age at first use was 17.3 ± 3.1 years, with a wide range (11–25 years). Frequency of use ranged from one to two times to 40 or more times with approximately half ($n = 24$) reporting what could be considered experimental use (two or fewer times). However, 7.5% ($n = 4$) of those who used flunitrazepam reported using it 10 to 19 times, and 11% ($n = 6$) reported using it 20 or more times.

Clear differences between users and nonusers emerged among some demographic and reproductive characteristics (Table 1). Users were significantly more likely to report white ethnicity, younger age at first intercourse, and having had one or more elective or spontaneous abortions. Users also were significantly more likely to report that their mother had

TABLE 1. Selected Demographic and Reproductive Characteristics*

Variable	Used Flunitrazepam [†]		P Level
	Yes (n = 53)	No (n = 851)	
Demographic			
Adolescent (≤ 21 y)	40 (76)	596 (70)	NS
Race			.001
White	33 (62)	288 (34)	
African-American	4 (8)	312 (37)	
Mexican-American	16 (30)	251 (30)	
Poor grades in school (C average or less)	11 (21)	86 (10)	.057
Employed	17 (33)	398 (47)	.045
Living with either parent	26 (49)	467 (55)	NS
Mother's education (≤ 12 y)	8 (15)	233 (28)	.049
Reproductive			
Age at first sexual activity (≤ 15 y)	43 (81)	452 (53)	.001
Parity (≥ 1)	27 (36)	380 (45)	NS
Gravidity (≥ 1)	27 (51)	464 (55)	NS
Abortions/miscarriages (≥ 1)	18 (34)	185 (22)	.039

* Denominator term varies across variables because of missing data. Percentages may not total 100 because of rounding.

[†] N (%).

at least a high school education. No significant group differences were noted on school enrollment (59% compared with 56%), having repeated one or more grades while in school (32% compared with 28%), or having an employed head of household (77% compared with 81%).

A majority of our sample (64%) reported having heard about this drug from one or more sources. The most common information source was the media (45%), followed by peers (21%). As expected, users achieved a higher mean score on the knowledge scale (8.0 ± 1.4 compared with 6.7 ± 1.7 ; $P < .001$). Users also were more likely to answer items correctly that assessed pill appearance, drug effects, and associated costs.

Lifetime substance use behaviors differed between users and nonusers of flunitrazepam (Table 2). Those who reported using this illegal substance were significantly more likely to report using alcohol, tobacco, marijuana, and LSD. In addition, users reported having higher rates of peer flunitrazepam use (89% compared with 14%; $P < .001$) and were more likely to report that their partner used this drug (21% compared with 1%; $P < .001$). Although seven flunitrazepam users denied the simultaneous use of any other drug, flunitrazepam was typically taken in combination with one or more drinks of alcohol (74%). In fact, 24 users reported drinking three or more drinks at last use. Approximately half of users ($n = 26$; 49%) reported taking flunitrazepam with other drugs such as marijuana. Sixteen users (30%) reported telling friends to try this drug, with most ($n = 11$) endorsing that their friend had followed their recommendation. Finally, 10% of users ($n = 6$) reported that they were physically or sexually assaulted after voluntary flunitrazepam use.

Use of flunitrazepam was reported in the following social contexts: 29 women reported using it with friends, 21 at parties, and 7 while on a date. Six women reported using this drug when alone.

Almost 4% ($n = 34$) of the entire sample experienced pressure to use flunitrazepam, which was most likely to occur when out with friends. In addition,

2% ($n = 18$) reported pressure to use while at a party, and only one person endorsed experiencing pressure from a date. Users of flunitrazepam were significantly more likely than were nonusers to report experiencing pressure to use flunitrazepam when out with peers and expressed a limited ability to resist using this drug (Table 3). Moreover, users were more likely than were nonusers to perceive little risk of harm from experimental use or to disapprove of experimental use by others.

Stepwise multiple logistic regression analyses were used to identify factors associated with past use of flunitrazepam. These analyses, which controlled for age and race/ethnicity, revealed five variables that were associated significantly with use (Table 4). Compared with nonusers, flunitrazepam users were 5 times more likely to report lifetime use of marijuana and almost 4 times more likely to report lifetime LSD use. In addition, they were nearly 3 times more likely to report experiencing pressure to use this drug and 22 times more likely to report that a friend or partner had used this substance. Interestingly, users also were more likely to report that their mothers had at least a high school education.

DISCUSSION

Most of the recent publicity surrounding flunitrazepam has focused on involuntary use associated with rape.⁵ However, voluntary use of this drug has increased among south Florida and Texas youth because it is illegally imported through Mexico and sold in the southeastern part of the United States^{4,7} An additional sign of increased voluntary use of this drug is that a number of Texas adolescents and young adults have received treatment for addiction to this substance.⁷ This article demonstrates that a small, but significant proportion of sexually active adolescents and young adult women attending family planning clinics in southeast Texas have used flunitrazepam voluntarily.

Like other sedative-hypnotics, flunitrazepam can produce physical dependence, and abrupt cessation may cause signs and symptoms of withdrawal in-

TABLE 2. History of Victimization and Substance Use Behaviors*

Variable	Used Flunitrazepam [†]		P Level
	Yes (n = 53)	No (n = 851)	
Previous victimization			
Physical	25 (47)	287 (34)	.046
Sexual	18 (34)	165 (20)	.013
Lifetime substance use			
Alcohol	53 (100)	771 (91)	.019
Tobacco	42 (79)	326 (38)	.001
Marijuana	51 (96)	473 (56)	.001
LSD	34 (64)	85 (10)	.001
Other drug use	40 (76)	87 (10)	.001
Peer and partner use of flunitrazepam			
Peer	47 (89)	121 (14)	.001
Partner	9 (21)	8 (1)	.001

* Denominator term varies across variables because of missing data.

[†] N (%).

TABLE 3. Risk of Harm and Disapproval of Flunitrazepam Use and Pressure to Use

Variable	Used Flunitrazepam [†]		P Level
	Yes (n = 53)	No (n = 851)	
Risk of harm to persons if (low)			
Experiments with flunitrazepam (≤ 2 times)	33 (62)	240 (28)	.001
Uses regularly	13 (25)	126 (15)	.057
Disapprove of peers who			
Experiment with flunitrazepam (≤ 2 times)	39 (74)	161 (19)	.001
Uses regularly	22 (42)	104 (12)	.001
Personal pressure to use flunitrazepam			
Limited ability to resist pressure	11 (21)	49 (6)	.001
Experienced when out with friends	15 (28)	19 (2)	.001

* Denominator term varies across variables because of missing data.

[†] N (%).

TABLE 4. Logistic Regression Model of Factors Associated With Flunitrazepam Use*

Variable	Adjusted OR	95% Confidence Interval
Mother's education (≥ 12 y)	2.6	1.1,6.5
Lifetime LSD use	3.6	1.7,7.6
Lifetime marijuana use	5.2	1.1,24.3
Peer or partner use of flunitrazepam	21.7	7.8,60.7
Experienced pressure to use	2.7	1.1,7.0

* Controlling for age and race/ethnicity.

cluding headache, muscle pain, insomnia and, in the most extreme cases, seizures.^{3,4} Furthermore, we found that a significant portion of users (55%) reported more than experimental use. In fact, 10 women reported having used flunitrazepam 10 times or more, which could place these young women at risk for dependence. The simultaneous use of alcohol or other illicit drugs with flunitrazepam reported by these young women increases their vulnerability to sexual assault because of the significantly enhanced sedative effects of these drug combinations. Finally, flunitrazepam does not appear to be a casual drug because its use is strongly associated with the use of LSD.

Youth often report using flunitrazepam to obtain a slowed-down, relaxed feeling similar to being drunk on alcohol. Users perceive that they become more talkative, more at ease, or more comfortable, particularly in social situations.⁶ Hence, flunitrazepam has been coined a "party drug."³ Our data confirm this drug's reputation because the most frequent settings associated with use were social situations with peers. The importance of peer influence on the substance use behaviors of female compared with that of male adolescents has been reported previously.¹² We observed that the voluntary use of flunitrazepam was associated strongly with peer or partner flunitrazepam use and experiencing pressure to use this substance. Interventions to decrease flunitrazepam use must focus on changing attitudes and behaviors of peers as well as of the individual.

We found that African-American adolescents and young adults were significantly less likely to report flunitrazepam use, which was consistent with other national and statewide surveys investigating prevalence of drug use behaviors.¹³ In fact, white women represented the highest proportion of flunitrazepam users. This finding was unexpected because use of flunitrazepam in Texas was first reported among Hispanic gang populations, and Hispanics represent the largest proportion of youth experiencing flunitrazepam related morbidities.⁷ In addition, Hispanics living in border towns use flunitrazepam in greater proportions than do youth from other race/ethnicities.⁷ However, our finding on race/ethnicity differences in past use of flunitrazepam must be interpreted cautiously because we sampled only young women who presented to community-based family clinics and not the larger Hispanic community of southeastern Texas.

We observed that more compared with less maternal education was associated significantly with use

of flunitrazepam. This finding is difficult to interpret, because we asked little about parental substance use attitudes or behaviors. Recent data from the *Monitoring the Future* study found that as the drug user's age increases, the percentage of users who report higher parental education also increases.¹⁴ However, Diem and associates¹⁵ did not find any relationship between parental education and alcohol, cigarette, or marijuana use in a sample of female Canadian adolescents.

We found that those women who reported using flunitrazepam were significantly more likely to report a history of physical or sexual victimization. Dembo and colleagues reported that physical and sexual abuse contributes substantially to alcohol and other drug abuse, findings that are consistent across gender, time, and different demographic samples.¹⁶⁻¹⁸ The 10% of flunitrazepam users in our sample who reported being physically or sexually victimized after taking this drug underscore the associated risk between this potent hypnotic and victimization with voluntary use.

Some limitations of our study should be addressed. Although we provided accepted definitions and common street names to all drugs assessed, we cannot be sure that those females identified as flunitrazepam users did in fact use this drug. However, given that users were significantly more knowledgeable about the physical appearance of the drug, described commonly reported drug effects, and had similar correlates to other illicit drug use, we are reasonably confident that those we identified as users did in fact use this illegal drug. Second, we chose to examine prevalence, patterns, and correlates of use in an at-risk population of female adolescents and young adults living near Mexico. Our findings may not generalize to sexually active females who present to other primary care settings, sexually inactive females, male adolescents and young adults, or women from other geographic locations.

It is difficult to speculate whether the use of flunitrazepam is a passing fad or will become an epidemic.⁴ To decrease the likelihood of this drug becoming even more popular among young people, it is critical to alert potential users to its danger. Intervention efforts to decrease use must address the entire peer network because of the social nature of its use. Because one quarter of flunitrazepam users reported little perceived risk from regular use, general prevention efforts also must stress the potential for addiction as well as other associated health risks.

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