

4-1997

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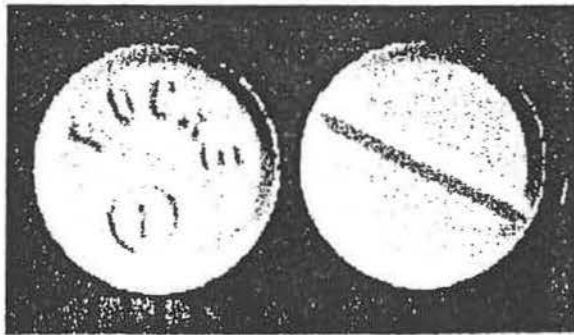
Perales, Marisol, "Flunitrazepam: A Comparative Study of Incidence Among Four Chattanooga Area Universities" (1997). *Senior Research Projects*. 149.

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Flunitrazepam:

A Comparative Study of Incidence Among Four Chattanooga Area  
Universities



(Anonymous 1, 1995)

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Honors Project

April 17, 1997

**Abstract:** Rohypnol is a form of the drug flunitrazepam that is similar to Valium but is up to ten times more powerful. It is known to cause temporary amnesia, muscle relaxation, sleep, and to impair motor skills. It is becoming increasingly popular among young adults because of its fast acting effects and because it intensifies the effects of alcohol and other drugs. The drug is spreading rapidly throughout the Southern United States. This study determines the exposure of the drug in four colleges in the Chattanooga, TN, area (Southern Adventist University, University of Tennessee at Chattanooga, Tennessee Temple University, and Lee College) by results of a survey. It also compares the proportion of students who have had access to the Rohypnol at SAU to the other two schools and finds that they are not significantly different. Significant difference was found in the proportion of students at SAU who had knowledge of the drug versus the proportion of students at the other three schools.

#### Introduction

Drug abuse is a problem that affects many people in the United States. As law officers and government agencies try to find the best solution to drug abuse, illegal drug use is increasing. Also, drugs manufactured for legitimate medical purposes are being used illegally.

One example is the tranquilizer Flunitrazepam, trade name Rohypnol, which was first marketed in Switzerland in 1975 by Hoffman-La Roche, Inc. (Anonymous 1, 1996). It belongs to the family of medications called benzodiazepines which include Valium (diazepam), Librium (chlorodiazepoxide) and Xanax (alprazolam). However, Rohypnol is about 10 to 20 times more powerful than these drugs (Smith et al,

1996). It is known on the streets by many different names including the following: "rohypnol," "roofies," "circles," "Mexican valium," "rib," "rope," "ruffies," and "la roche." It is also commonly known as the "forget pill," or as the "date rape drug" (Smith et al., 1996).

The Hoffman-La Roche package insert for Rohypnol describes it as the following:

"A benzodiazepine agonist with anxiolytic, anticonvulsant, and sedative effects that slow psychomotor performance and induce amnesia, muscle relaxation and sleep" (Maxwell and Hall, 1995).

It was originally prescribed for severe sleep disorders and inpatient psychiatric patients. It can also be used for anxiety, convulsive seizures, skeletal muscle spasms, acute alcohol withdrawal, conscious sedation, and preanesthesia (Maxwell and Hall, 1995). Used alone in low doses, the drug produces a sedative effect, amnesia, muscle relaxation, and a slowing of psychomotor responses (Staten, 1996). With a 1 mg dose, the drug's effects begin within 30 minutes, will peak about 1-2 hours after ingestion, and fall to one-half their peak after 16 to 35 hours (Smith, et al). Some of its effects can be detected up to 60 hours after ingestion (Lively, 1996). High doses can cause coma, respiratory depression, and even death. Ingestion can also cause reactions and side effects (see Table 1). Anterograde amnesia can last up to 1 1/2 days (Maxwell and Hall, 1995).

Table 1

Reactions and Side Effects Associated with the Use of Rohypnol  
(Maxwell and Hall, 1995)

Reactions:	Restlessness	Side effects:	Drowsiness
	Agitation		Headaches
	Irritability		Memory impairment
	Aggressiveness		Dizziness
More rarely:	Delusion		Ataxia
	Rages		Tremors
	Nightmares		Psychomotor impairment
	Hallucinations		
	Psychoses		

Like other sedatives, Rohypnol can produce physical dependence and abrupt cessation may cause problems; in fact, unmanaged withdrawal signs and symptoms may be life-endangering. One must be withdrawn from the drug slowly usually using a Phenobarbital.

Rohypnol is odorless, colorless, and tasteless. It is available in 1 and 2 mg tablets. The tablets are white, and have "ROCHE" stamped in a half circle over the number 1 or 2 (Anonymous 1, 1995). It is relatively inexpensive and is usually sold for as little as \$2.00-\$5.00 per tablet (Anonymous 5, 1996).

Rohypnol is legal in 64 countries, including Mexico, South America, Europe and Asia (Anonymous 2, 1996), and it is the most widely prescribed sedative/hypnotic in Europe. Although it is not licensed for sale in the US, it has been confiscated from users in the States; in fact abuse has been reported on every inhabited continent in the world (Anonymous 3, 1995).

Between 1985 and 1991, DEA had three cases or less each year involving Rohypnol, but after 1993 the number of cases has increased

steadily. By 1995, DEA had 38 ongoing Rohypnol investigations with the U.S. Customs Service conducting 271 more. Nationwide, state and local law enforcement reported 2,067 cases involving the illegal distribution or possession of the substance by March of 1996 (Anonymous 1, 1996).

The most popular states for Rohypnol abuse are the Southern states from California to Florida, with Texas and Florida observing the highest amount of activity involving the drug. Epidemiologists from south Florida have stated that it is the fastest growing drug problem in that region (Anonymous 4, 1995).

Young adults choose Rohypnol for many reasons. It is inexpensive and easy to find. Possession of Rohypnol is not a criminal offense; it is cheaper than alcohol, and it can increase the effects of alcohol without raising alcohol levels. Also, it is hard to detect; in fact, only expensive urine tests are able to detect its presence.

Law officers are working on measures to combat these problems to prevent the increased use Rohypnol. The policy most people believe in taking is understood best by Senator Joseph R. Biden's own words in his testimony to a congressional hearing on Rohypnol:

"The best time to target a new drug with uncompromising enforcement pressure is before abuse of that drug has overwhelmed our communities. The advantages of doing so are clear--early on, there are fewer pushers trafficking in the drug and, most important, fewer lives and fewer families have yet suffered from abuse of the drug" (Biden, 1996).

The primary objective of this study was to determine the exposure of the drug in colleges in the Chattanooga, TN, area. Other objectives included determining if there was a difference in the incidence of

Rohypnol between SAU and other local colleges. The primary hypotheses were as follows:

1. The proportion of students at SAU who have had access to Rohypnol is equal to the proportion of students at other colleges who have had access to Rohypnol.
2. The proportion of students at SAU who have had access to Rohypnol or known someone who has used the drug is equal to the proportion of students at other colleges who have had access to Rohypnol or known someone who has used the drug.
3. The proportion of students at SAU who have never heard of Rohypnol is equal to the proportion of students at other colleges who have never heard of Rohypnol.

#### **Methods and Materials**

Surveys were passed out in classes with an enrollment close to 100 students at Southern Adventist University, University of Tennessee at Chattanooga, Lee College, and Tennessee Temple University. These were collected at the end of the class lecture. Students were given the choice in whether they wanted to complete the survey; some schools offered their students extra credit for filling them out.

The surveys consisted of two parts. The first part obtained general information about the student including their sex, major, year, and state of permanent address. The second part consisted of six questions about the student's knowledge and exposure to Rohypnol. Subjects included in the question were knowledge of the drug, access or use of Rohypnol. Students were advised not to write their names or any identifying information on the survey in order to keep the information completely confidential (See Appendix 1).

Data analysis consisted of comparisons of student population proportions, using the z test where appropriate to show significant differences between proportions  $z = \frac{(P_{\text{Other Schools}} - P_{\text{SAU}}) - 0}{\sqrt{pq/n_{\text{Other Schools}} + pq/n_{\text{SAU}}}}$ .

**Results**

Four local colleges were investigated, which included University of Tennessee at Chattanooga, Southern Adventist University, Lee College, and Tennessee Temple University. The University of Tennessee at Chattanooga (UTC) is a large public university with a population of 7,021 undergraduate students and located in downtown Chattanooga. Tennessee Temple University, also located in downtown Chattanooga, is a small Christian private university. Southern Adventist University (SAU), located about 15 minutes outside of Chattanooga in Collegedale, is a private Seventh-day Adventist University. SAU's student body consists of 1,442 students. Lee College, a private Church of God college, is located 20 miles from Chattanooga in Cleveland, TN, and has 2,652 students.

A total of 469 surveys were analyzed from the different schools. Most of the surveys came from UTC and SAU, with the least amount of surveys coming from Temple (See Fig. 1). Also, most of the surveys came from freshmen and/or females (See Fig. 2 & 3). 51% of students who responded were from Tennessee (See Fig. 4).

Most students who answered the survey had heard of Rohypnol before the survey, but at least 33% of students who responded stated that they had never heard of the drug. Eleven percent of students surveyed stated that they had either had access to the Rohypnol personally who knew someone who had; 7% (35 students) had had personal access, while 4% (18 students) knew of someone who had (See Fig. 5). Of



the 35 students who had had access to Rohypnol, the number of Tennessee residents varied depending on which school they attended. Students who responded from UTC lived in Chattanooga while students from Lee lived in other states; SAU and Temple had varying numbers of students living in other states (See Fig. 6).

The proportion of SAU students who had had access to Rohypnol were compared to the proportion of students at the other three schools using a z test to show any significant differences. The critical value of the test was determined to be  $\pm 1.96$ . Any z scores that were above or below these values showed significant difference between the two proportions. All comparisons fit within the assigned critical values, showing that there were no significant differences between the proportions (See Table 2). When the proportion of students at UTC who had had access to Rohypnol was compared to the other three schools combined, the z score indicated that the proportions were not significantly different (-0.142).

The proportion of SAU students who had had access to Rohypnol or had known someone who had was then compared to all the other schools using the above procedures. All z scores again showed that there were no significant difference between proportions (See Table 2).

The proportion of SAU students who had never heard of the Rohypnol was also compared to the other three schools. The z scores for this test showed significant difference between SAU versus UTC, and SAU versus Lee (See Table 2).

The proportion of students who had never heard of the drug at UTC was also compared to the proportions at Temple and Lee. Both z scores showed significant difference, 2.51 when UTC was compared with Temple,

and 5.38 when UTC was compared with Lee. A comparison of the proportion of students from UTC who had never heard of the drug compared to all other schools combined gave a z score that showed major significant difference, 4.60.

#### **Discussion**

James Tolliver, from the DEA, reports that there are 4,070 cases of Rohypnol possession in the United States on record as of January 1997. The state of Tennessee only accounts for two of those cases at the beginning of 1996, since the DEA has not polled Tennessee in a year. He did not specify where in Tennessee the drug was found. DEA only includes cases in which the drug has been seized by police and analyzed by a lab to be Rohypnol (Tolliver, 1997). The DEA reports will always be lower than what is actually sold on the street; yet, these results suggest that the incidence of Rohypnol in Tennessee is higher than suggested by DEA reports. Certainly, Tennessee should be polled again because Rohypnol is spreading across the United States at a fast rate.

The proportions of students who have had access to Rohypnol were not significantly different between any of the schools that were surveyed. One would think that Christian schools would have a lower proportion of students who had come in contact with the drug than at a public university, but that was not the case. However, one important trend to realize is the fact that most students at the three private schools were not from Tennessee, and probably did not have access to Rohypnol in Tennessee. In fact, one student wrote, "Not many people use Roofies in TN because its not a coastal state, and they are hard to find cheap."

Of the twelve students from SAU who had access to Rohypnol, only five stated that they had found it in Chattanooga. Only one student from Temple and none from Lee had found it in Chattanooga, while ten of the thirteen students from UTC had had access to Rohypnol in Chattanooga. These numbers suggest that the results from UTC may be a better indicator of the actual incidence of Rohypnol use in the Chattanooga area than the rest of the schools. It seems that even though the other schools had a similar proportion of students who had had access to the drug, these students mostly had found it in cities in other states where Rohypnol is more prevalent. One student wrote, "I have never heard of anyone taking or having access to Roofies since I have been at SAU. They are pretty easy to get in Orlando though."

The results did show a significant amount of difference between the proportions of students who had heard of Rohypnol before taking the survey. More people surveyed had heard about the drug in UTC than in any of the other schools (135 out of 169 students), (See Fig 7). SAU and Temple had about 65% of the students surveyed having some knowledge of the drug (See Fig. 8,9), while Lee had about 53% of the students surveyed having no prior knowledge of the drug (47 out of 89 students), (See Fig. 10).

These results could indicate that more literature has been available for UTC students on Rohypnol than at other schools (ie. newspaper articles, pamphlets, posters, etc.). However, it could also indicate the drug being found more readily on this campus, since more students surveyed at UTC answered that they at least knew of someone who had used the drug (13 out of 169 students). Clearly though, more

information about Rohypnol should be available to students at the other three schools, especially Lee College.

Not only should more general information about Rohypnol be provided, but specifically about the dangers of this drug. Most students who have heard of the drug indicated that they heard about it through either the news or friends. Certainly it has been a popular item in news articles and stories, since its use in date rape cases has been highly controversial and public. In Broward County, Florida, 10 men have been arrested on roofie-rape charges in the past year. One man, who pleaded guilty to roofie rape in a 1995 case, told authorities he used it to rape as many as 40 women (Manning, 1996). Another man who also pleaded guilty to one count of sexual assault in Coral Springs, Florida, boasted that he had attacked as many as 20 women (Anonymous 2, 1996). Still, many students do not realize the danger of Rohypnol. One student surveyed stated, "Roofies is one of the drugs to be least worried about."

Included in the survey is a list of effects (See Appendix 1) that students were asked to indicate which they thought Rohypnol might produce in the user. Of the 35 students who indicated that they had access to the drug only seven correctly answered that Rohypnol is addictive. Most students circled the least dangerous effects associated with the drug, headaches, confusion, drowsiness, decreased inhibitions, and hallucinations. One student commented that the drug caused him to "black out." Very few indicated knowledge of the more serious effects of the drug, such as shock, coma, grand mal seizures, cardiovascular collapse and death. Only two of the 35 students who had had access to the drug correctly circled all the effects listed. Of the 259 students

who had heard of Rohypnol, only nine also correctly circled all the effects, which accounts for only 33 of the students surveyed. One student told the story of a person who had taken the drug:

"The individual (with whom I am acquainted) that took the substance did so approximately three years ago during a party. He proceeded to stumble around the room saying everyone was naked. He began to take his clothes off, but was taken home by another friend. The next day, he could not remember the incident. His head and chest hurt, and he could not urinate. To my knowledge he has not taken Rohypnol again."

Certainly, these results indicate that more education is key to reduce the rising incidence of Rohypnol in the Chattanooga area. One student commented that a Channel 12 employee stated "this drug is very present in Chattanooga and can be found easier than most drugs such as heroin and crack-cocaine." This project set out to determine if there was an incidence of the drug in the Chattanooga area since not much information was found on the Chattanooga area in the literature. Truly, the results agree with one student's comment, "You can get it virtually anywhere."

More research is needed in finding who is profiting, dealing, and pushing the drug. Research is also needed of case descriptions, including degrees of severity in order to describe the epidemic. There is not much literature on this topic and more information is needed in order to educate people.

In order to fight Rohypnol, the first place to start is for officials and school administrators to realize that it can be found on their campuses. Educating people about its effects will help deal with

the potential problem in order for use not to increase, and help protect against some of its criminal uses such as date rape.

Figure 1

The Distribution of Students who Answered the Survey from Each Individual School

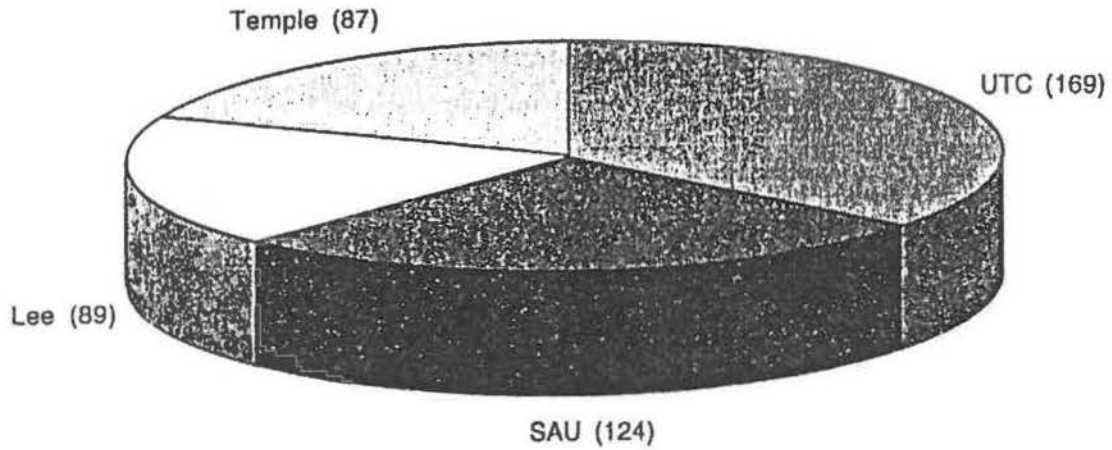


Figure 2

The Distribution of Students who Answered the Survey According to Class

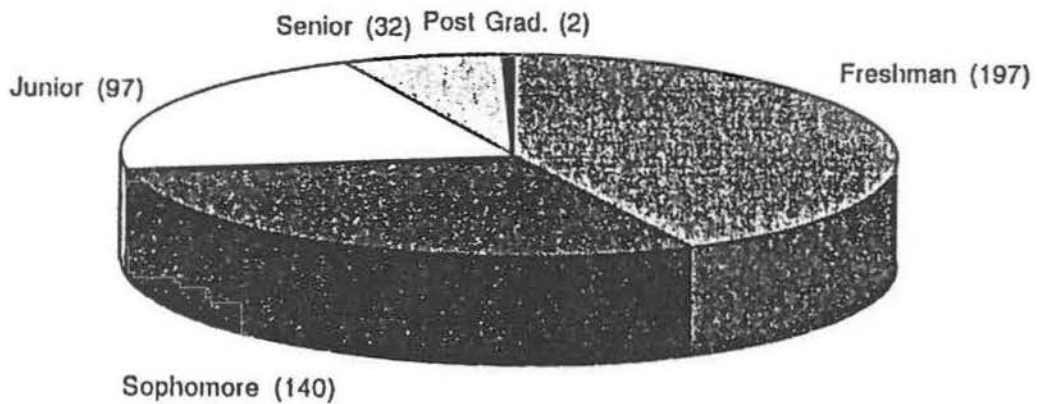


Figure 3

The Distribution of Students who Answered the Survey According to Sex

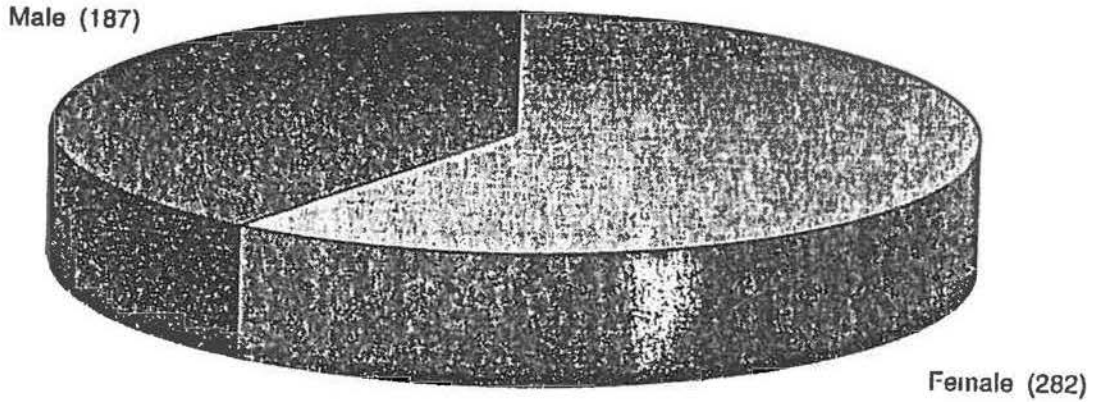


Figure 4

The Distribution of Students who Answered the Survey According to State Residency

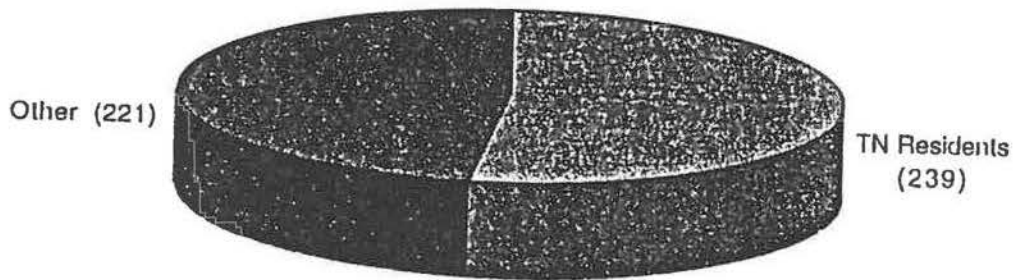
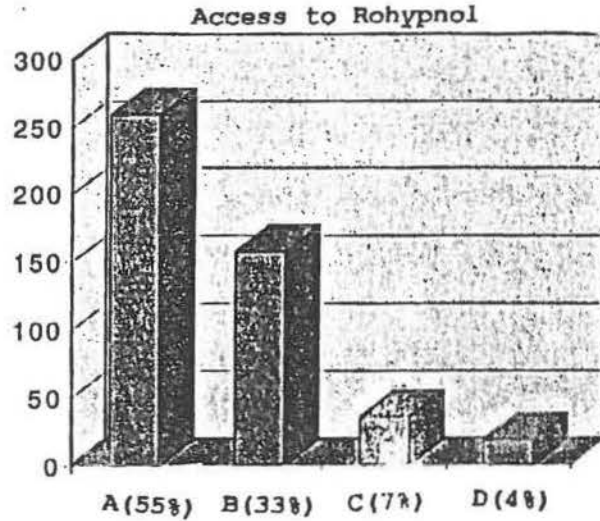




Figure 5

The Distribution of the Total Number of Students Who Had Knowledge or



- A: The number of students who had heard of Rohypnol before taking the survey.
- B: The number of students who had never heard of Rohypnol before taking the survey.
- C: The number of students who had had access to Rohypnol.
- D: The number of students who knew someone who had used Rohypnol.

Figure 6

The Distribution of Students who had had Access to Rohypnol by Residency

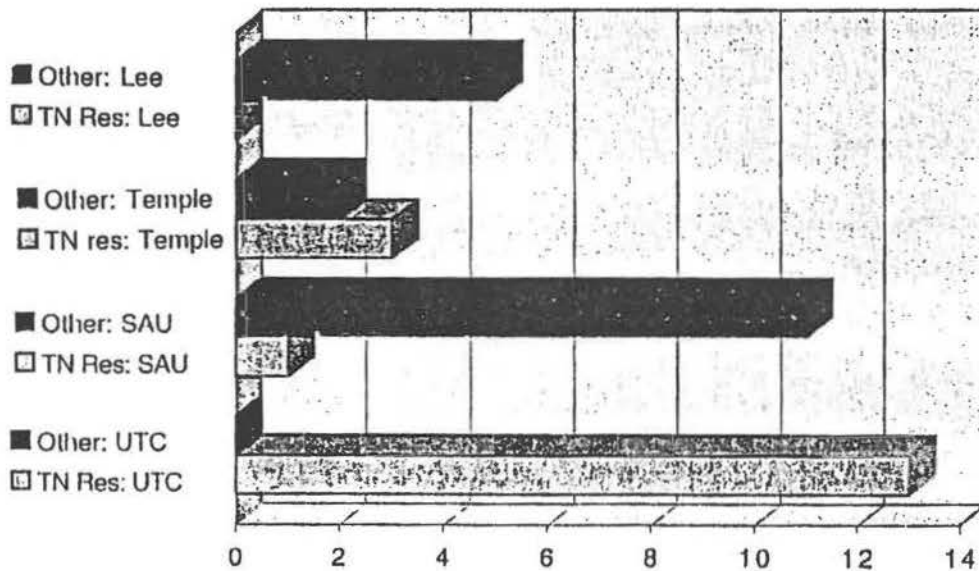
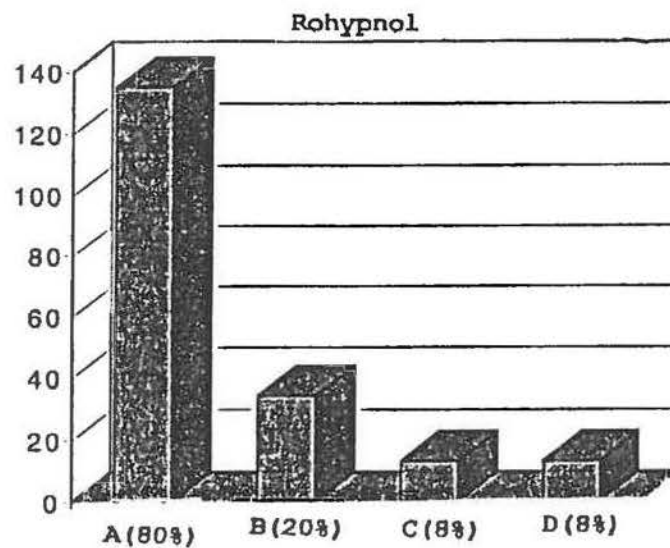


Figure 7

The Distribution of Students from UTC Who Had Knowledge or Access to



- A: The number of students who had heard of Rohypnol before taking the survey.
- B: The number of students who had never heard of Rohypnol before taking the survey.
- C: The number of students who had had access to Rohypnol.
- D: The number of students who knew someone who had used Rohypnol.

Figure 8

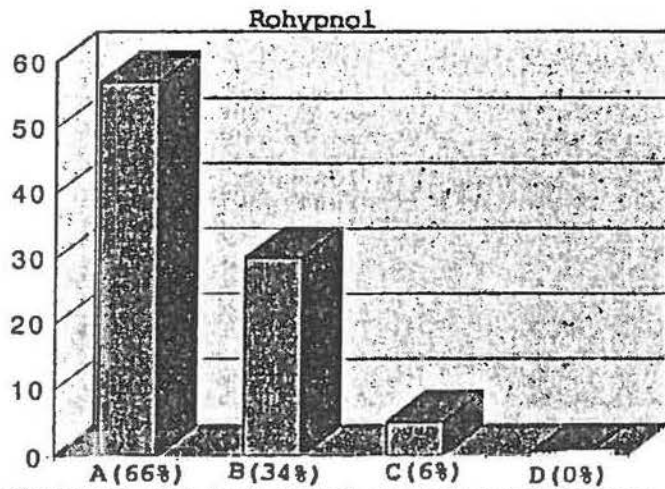
The Distribution of Students From SAU Who Had Knowledge or Access to Rohypnol



- A: The number of students who had heard of Rohypnol before taking the survey.
- B: The number of students who had never heard of Rohypnol before taking the survey.
- C: The number of students who had had access to Rohypnol.
- D: The number of students who knew someone who had used Rohypnol.

Figure 9

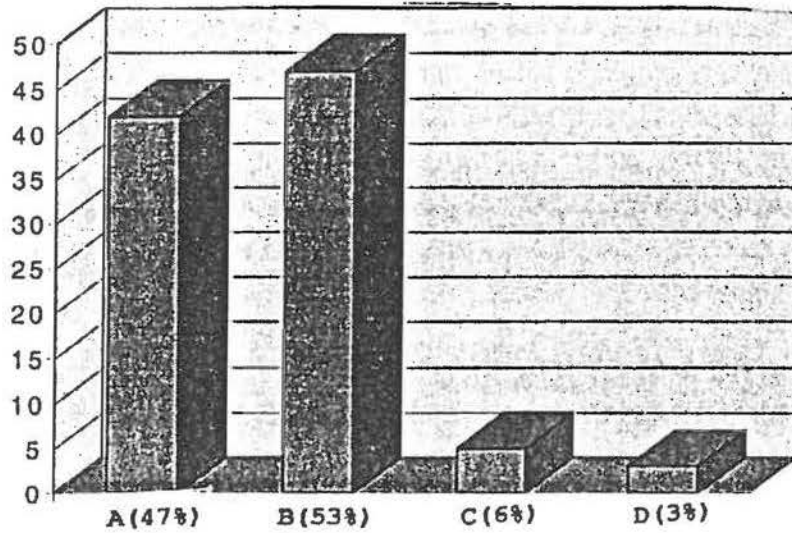
The Distribution of Students from Temple Who Had Knowledge or Access to



- A: The number of students who had heard of Rohypnol before taking the survey.
- B: The number of students who had never heard of Rohypnol before taking the survey.
- C: The number of students who had had access to Rohypnol.
- D: The number of students who knew someone who had used Rohypnol.

Figure 10

The Distribution of Students from Temple Who Had Knowledge or Access to Rohypnol



- A: The number of students who had heard of Rohypnol before taking the survey.
- B: The number of students who had never heard of Rohypnol before taking the survey.
- C: The number of students who had had access to Rohypnol.
- D: The number of students who knew someone who had used Rohypnol.

Table 2

The Z Scores Comparing the Proportion of Students from SAU Who had Knowledge of Rohypnol or Had Access to Rohypnol to the Proportion of Students from Other Schools

	UTC	Lee	Temple	Combined
Proportion of students who have never heard of Rohypnol	-3.230	2.280	-0.389	
Proportion of students who have had access to Rohypnol	-0.071	-1.080	-1.030	-1.090
Proportion of students who have had access or know someone who has had access to Rohypnol	1.010	-0.545	-1.390	0.004

Note: A z score that is not within the critical range of +/- 1.96 shows significant difference between the two population proportions.

#### Literature Cited

1. **Anonymous 1**, 1995. Flunitrazepam. DEA Highlights. <http://www.usdoj.g...ypnol/rohypnol.htm> (22 Sept. 1996).
2. **Anonymous 2**, 1996. Victims of 'Date Rape' Drug Test. Found on Netscape on the CNN homepage (30 Sept. 1996)
3. **Anonymous 3**, 1995. Fact Sheet on Rohypnol. Provided by the National Institute on Drug Abuse from the Epidemiologic Trends in Drug Abuse-Advance Report by the Community Epidemiology Work Group. Found on Netscape (13 Oct. 1996).
4. **Anonymous 4**, 1995. Drug Abuse Alert: Rohypnol. CESAR FAX. 4(24):3-4.
5. **Anonymous 5**, 1996. Importing of sedative Rohypnol. Facts on File. 23(104):285.
6. **Biden, J. R. Jr.**, 1996. In Testimony of Senator Joseph r. Biden, Jr. Committee on Foreign Relations Subcommittee on the Western Hemisphere Hearing on "The New International Threat of Date-rape Drug Trafficking." Found on Netscape (13 Oct. 1996).
7. **Lively, K.**, 1995. The 'Date-Rape Drug'. The Chronicle. 42(42)29-30.
8. **Manning, A.**, 1996. Memory Loss Makes Cases Tough to Prove. USA Today. October 29: 1D-2D.
9. **Maxwell J.M.A.**, and **J. Hall**, 1995. Flunitrazepam Abuse in Europe and the United States. Drug Abuse Epidemiologic Surveillance. June issue:363-370.
10. **Smith, D.E.**, **D.R. Wesson**, and **S.R. Calhoun**, 1996. Rohypnol (Flunitrazepam) Fact Sheet. Prepared by Haight Ashbury Free Clinics.
11. **Staten, C.**, 1996. 'Roofies' called 'Date Rape Drug of Choice'. The American Reporter. 2(196):34-35.
12. **Tolliver, J.**, 1997. Personal communication. April 15.

**Appendix 1**



## Research Questionnaire

Dear Respondent,

I am conducting a brief survey to determine the incidence of the drug Rohypnol in the Chattanooga area. In order to do this, I am sampling a few of the Chattanooga area college students. I would appreciate if you take a few moments to complete this questionnaire, since your input would be very valuable to me.

The questionnaire has been designed so that you can complete it very quickly and easily. It takes only a few minutes, and you need only to circle your answers.

You can be absolutely sure that all of the information you provide is strictly confidential. Please do not put your name anywhere on the survey. Your answers will be combined with those of many others and used only for statistical analysis.

Thank you,

Marisol Perales

Rohypnol Questionnaire

Rohypnol is a drug that is illegal in the United States. It is similar to Valium, but ten times more powerful. It is known as "The Date Rape Drug," "Roofies," "Rope," and "Roaches".

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Part I

Please answer the questions as honestly as possible.  
Check the answer that best applies:

1. Year: F S JR SR
  2. Sex: M F
  3. Major:
  4. State of Legal Residence (State Only):
- 

Part II

1. a) Have you heard of Rohypnol before this survey?

Yes No

- b) From where?

Paper Friends

News Class

Magazine Other (List):

2. How dangerous do you think it is (Circle the number)?

1 2 3 4 5 6 7 8 9 10  
Not dangerous Very Dangerous

3. a) Have you ever had access to the drug (ie..could you buy it, was it offered to you)?

Yes No

- b) Where (as in what city or state: Chattanooga, Miami, Texas)?

4. Do you know of anyone who has taken Rohypnol?

Yes                  No

5. If yes to 3 or 4, did you/they combine it with alcohol or any other drug?

Yes                  No

6. Circle the effects that you think Rohypnol might have:

Memory Loss

Aggressiveness

Drowsiness

Restlessness

Visual Disturbances

Addiction

Dizziness

Headaches

Decreased inhibitions

Tremors

Confusion

Rages

Urinary retention

Hallucinations

Insomnia

Grand mal seizures

Shock

Cardiovascular collapse

Coma

Death

7. Other Comments or Questions: