THE VALIDITY OF PEER RESPONSES AS A TOOL FOR SCREENING AT-RISK STUDENTS: A PRELIMINARY ANALYSIS

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Abstract. Students are becoming the majority of new amphetamine users in Thailand. This study compared urinalysis results with peer responses to individual characteristics related to substance use with the aim of identifying "at-risk" students. A randomly selected group of students from a public high school in northern Thailand was asked to fill out the names of classmates they viewed as having any of forty-three risk behaviors set out in a questionnaire. A total of 564 students were included, from whom urine specimens were collected on the first two days following the school break. An immunoassay test was used to screen the specimens and positive results were confirmed using thin-layer chromatography. About 4% of urinalysis results were methamphetamine-positive. Using urine test results as the standard, the sensitivity of peer responses to alienated behavior was 81.8%, while frequent class/school absenteeism and low concentration levels were somewhat lower, at 77% and 68%, respectively. Delinquency showed the least sensitivity at 50%. The McNemar χ^2 test showed significant differences between urine test results and each peer response subscale ($p < 0.001$). This preliminary analysis has shown that peer responses with regard to substance-related behavior compare well with urine test results.

INTRODUCTION

Substance use is a major national problem in Thailand. Early evidence of an illicit supply of amphetamine-type stimulants (ATS) was discovered in the suburbs of Bangkok, in 1986. Students were becoming the majority of new ATS users, from 31% in 1995, to a peak in 1998 of 45% (Poshyachinda *et al*, 2000). In a recent national household survey to estimate the population related to substance abuse, about 28% of those who had ever used AST were adolescents aged 12-14 years (Institute of Health Research, 2002). The possession or use of illicit substances is observed as highly illegal in Thailand. Thus, responses obtained from household interviews or self-reported surveys could be inaccurate due to the sensitive nature of this type of behavior. Despite the ease and non-intrusiveness of self-reported surveys, a significant drawback is the questionable validity of reports due to unreliable responses (Skog, 1992).

The availability of toxicological tests that can detect substance use from biological specimens (*eg* urine, hair, blood and saliva) has grown in importance as an outcome variable for research into the treatment of substance abuse. Testing methods fall into either screening or confirmation assays. Urine is most often used in substance abuse screening. Although urinalysis is an objective measure that is independent of subject memory or accuracy, the method also has some limitations. Unlike a self-reported response, a substance must be present in the body for a range of time to be detected. The duration of this time is dependent on a number of factors, including the substance itself (*eg* biological half-life), dose, time of administration, amount of fluid consumed, individual differences in metabolism and excretion, and characteristics of the assay (Cone and Dickerson, 1992). Moreover, the cost of urinalysis per specimen in Thailand is considered high, even for screening assays. Confirmation assays are more expensive, but they are also more specific in identifying drug use.

The legal issue of drug testing in school students may be controversial, as to whether any-

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one has the right to request a drug test. The decision of school administrations to test students is often based on concerns about the harm that they are doing themselves, other students, their families and their school community. Most people seem to agree with this policy, but our question is how to achieve the goal in practice with a more cost-effective approach.

In this study, aside from urinalysis, other methods have been explored for their potential to validate substance abuse among school students. Reports by teachers, counselors, and classmates on types of deviant behavior have been used to demonstrate a relationship with qualitative urinalysis results. We therefore hypothesized that peer responses to classmate characteristics related to substance use would closely parallel the prevalence of positive urine tests. The aim was to develop a less expensive, yet effective, screening tool for the early identification of high-risk students, for whom selected preventive approaches would be continued.

MATERIALS AND METHODS

Subjects

A sample of 564 students in grades 7-11, who attended a public high school in the municipal area of Chiang Mai Province, northern Thailand, was surveyed.

Questionnaire design

We developed a forty-three item questionnaire of risk behavior, which was associated with a higher likelihood of substance use. Risk and protective factors were found to be better predictors of substance use than were other variables, such as gender and race/ethnicity (demographic variables) (Office of Applied Studies, 1997). Some risk factors that showed a correlation with adolescent substance use were (Kelly and Sander, 2001): feeling detached from school; academic failure; poor school performance; low commitment to education; peer substance use/peer norms; friends who engaged in problem behaviors; alienation.

To evaluate the extent to which risk behaviors existed among school students, a 4-subscale questionnaire, consisting of forty-three items was developed on the basis of relevance to risk factors for student substance abuse. Each type of behavior was listed with a short objective description that could be easily observed and understood by students of grades 7-11. The four subscales were frequent class/school absenteeism (5 items), low concentration level (8 items), alienated behavior (16 items), and delinquent behavior (14 items).

Data collection

The sample data were collected by three-stage sampling during the school session January-February 2001, as follows:

In stage 1, a group of 200 students was randomly selected from 40 classes in grades 7-11 (five students per class). The purpose of the survey was explained and the students were asked to complete anonymous self-administered questionnaires. For each type of behavior listed in the form, every student was asked to write down the names of classmates they observed having or showing any signs.

In stage 2, all answered questionnaires were collected and processed. The name of each student on the form was recorded, along with the presence of any risk behavior checked by their peer. To select subjects for inclusion in the study, the types of risk behaviors pertaining to the students who admitted using a substance were used as cutoff references: 10 or more, and 8 or more, types for male and female students, respectively. After applying the reference, there was a total of 282 students identified as high-risk. As a control group, another 282 students who had not indulged in any of the risk behaviors, were randomly selected.

In stage 3, 564 students were selected before they were asked to provide urine specimens on the first two school days directly after a weekend break. All the urine specimens were qualitatively analyzed using the immunoassay-screening test by the Regional Medical Science Center in Chiang Mai for the presence of substances. In this instance, the immunoassay kits were able to identify methamphetamine, heroin and marijuana. All the positive specimens were confirmed by thin-layer chromatography (TLC) using a cutoff

concentration of 1,000 ng/ml.

Data analysis

Descriptive statistics were computed for the urine test results. Differences between the proportion presenting each subscale on the peer responses, and that testing positive on the urine test were evaluated using the McNemar test. The validity of the peer responses was evaluated against the urine test results by calculating sensitivity and specificity.

RESULTS

Table 1 shows the demographic characteristics and urine test results of the 564 students. There were 22 positive urinalysis samples (3.9%); 21 were for methamphetamine and 1 for heroin. Although the proportions of positive tests were equal between genders, there was a higher prevalence of substance use among female students (5.0% versus 3.2%). Eighty-two percent of drug users were students in grades 10 (10 students) and 11 (8 students); grade 11 reported a slightly higher prevalence (8.5% *vs* 8.4%).

Table 2 shows comparative sample prevalence rates of substance use between the toxicological and peer-response measures. The results of McNemar χ^2 test indicated that the differences between positive urinalysis and the presence of each peer response subscale were highly significant.

Table 1
Demographic characteristics and urine test results, Chiang Mai, Thailand, 2001.

	No. of students (%) (N=564)	Positive urine test (%) (n=22)
Gender		
Male	344 (61.0)	11 (50.0)
Female	220 (39.0)	11 (50.0)
Grade		
7	146 (25.9)	2 (9.1)
8	97 (17.2)	1 (4.5)
9	108 (19.1)	1 (4.5)
10	119 (21.1)	10 (45.5)
11	94 (16.7)	8 (36.4)

The prevalence estimates, based on urinalysis, were 1.2, 1.3 and 1.4 times the estimates generated from the peer responses to the presence of alienated behavior, frequent class/school absenteeism and low concentration level, respectively. The test-based estimate was 2.1 times the rates generated from the delinquent behavior subscale.

Estimates of specificity and sensitivity are shown in Table 3. Specificity was 78.7% or lower

Table 2
Sample prevalence rates by urine test and peer response, Chiang Mai, Thailand, 2001.

Measures	N	%	p[a]
Urine test positive	22	3.9	
Peer responses			
Alienated behavior	18	3.2	0.000002
Frequent class/school absenteeism	17	3.0	0.000002
Low concentration level	15	2.7	0.000002
Delinquent behavior	11	1.9	0.000001

[a]Exact p-values of the McNemar χ^2 statistic.

Table 3
Validity statistics: peer responses versus urine tests, Chiang Mai, Thailand, 2001.

	Urine test	
	+ve	-ve
Alienated behavior		
Presence	18	284
No presence	4	258
Sensitivity = 81.8 Specificity = 47.6		
Frequent class/school absenteeism		
Presence	17	207
No presence	5	335
Sensitivity = 77.3 Specificity = 61.8		
Low concentration level		
Presence	15	260
No presence	7	282
Sensitivity = 68.2 Specificity = 52.0		
Delinquent behavior		
Presence	11	115
No presence	11	427
Sensitivity = 50.0 Specificity = 78.7		

for all behavior reported by peers. Sensitivity toward alienated behavior was highest, at 81.8%. Sensitivity estimates for frequent class/school absenteeism and low concentration level were somewhat lower (77.3% and 68.2%, respectively). Although delinquent behavior reported the lowest sensitivity of 50.0%, it had the highest specificity.

DISCUSSION

The school has been recognized as important in general development context, as well a specific relationship to substance use and delinquency. Adolescence is a period of very rapid behavioral change, especially with regard to substance use. Therefore, drug testing of secondary school students in Thailand has recently become the subject of increased public interest. Illicit drug use, especially in amphetamine-type stimulants (ATS), is relatively common among school children. The estimated prevalence, based on urinalysis in this study, was 3.9% (21 for methamphetamine and 1 for heroin), which is lower than that of the 1999 survey among northern secondary students that revealed a prevalence of having ever used ATS of 5.0% (Poshyachinda *et al*, 2000). A higher prevalence of positive tests among female students has escalated alarmed concern. One positive test for heroin was from a grade 11 female student. In the study of Huizinga *et al* (1993), females reported higher rates of engagement in alcohol/drug use and sexual activity than males. Findings from the 1997 national household survey on drug use in the United States reported a relatively small difference between males and females, but a steadily increasing drug use pattern in those aged 12 to 17.

The smaller number of positive test results among students of lower secondary level (7-9) indicated that most current substance users were occasional users, while the upper level (10-11) students revealed use on a more regular basis, especially during the weekend break. Poshyachinda *et al* (2000) studied the subset of new ATS cases from 1995-1999 and found that the lower secondary level had only a slightly higher percentage range than the upper secondary level (40.6-52.7% *vs* 39.8-50.4%). The mean age of first ATS use was consistently 15 years, which was about the age of students in grade 10.

The sample prevalence rates to the presence of alienated behavior, frequent class/school absenteeism and low concentration level, using peer responses were slightly lower than those detected by positive urinalysis. The sensitivity of these three peer response subscales was generally high, at 81.8%, 77.3%, and 68.2%, respectively. The responses to delinquency behavior showed a prevalence of only half those reported by the urinalysis tests (1.9% *vs* 3.9%) and revealed the lowest sensitivity, at 50.0%. A potential explanation for the higher sensitivity of the response to alienated behavior and frequent class/school absenteeism may lie in the perceptible behavior listed in these two subscales, together with the externalizing of individual characteristics. The 16 items of alienated behavior were written in concise phrases of problem behaviors, such as aggression, rebellion, bravery, avoiding eye contact, withdrawal from friends, restlessness, lying to get by, etc. Frequent absenteeism from school or not attending class was easily observed by classmates. Petraitis *et al* (1998) reviewed findings from 58 prospective studies of illicit substance use (ISU) among adolescents. The bulk of evidence concluded that ISU was rarely the first problem occurring among adolescents, but more often followed other problem behaviors. ISU was also closely related to deviant peer bonding and detachment from and rebellion against religion, school, and family. Adolescents who could not control their emotions and who were aggressive around people were more likely to use illicit substances. Delinquent behavior was less obvious among classmates, since that behavior was likely to occur outside school, such as smoking, drinking alcohol, use of illicit substances, quarreling, gambling, etc.

Hawkins *et al* (1992) studied the adolescent risk and protective factors for alcohol and other drug problems and indicated that peer use of substances was one of the strongest predictors of drug use among youth. Adolescents who are deviant, independent, and not bonded to society are more likely to use drugs.

As in our findings, a high sensitivity in three out of four subscales can explain the validity of

peer responses. In particular, peer responses could be used to screen students with problem behaviors. These problem behaviors have been found to be school-level predictors of illicit substance use (Hawkins *et al*, 1992; Windle, 1993; Petraitis, 1998). Many studies have contended that preventing adolescents from the risk of using substances is more cost-effective than treatment (Chatterji, 1997). The timing of program implementation is quite important. Prevention programs seem to work best for those who are not yet engaging in risky behavior. Peer response is expected to be a screening tool to identify individual characteristics that can be used for selecting high-risk individuals for intervention programs.

Conclusion

This study aimed to develop a measure for screening individual school students, to select them into a high-risk group for preventive intervention. The results indicated that peer responses seemed to be a valid method of detecting students with high-risk behavior. The peer responses to three subscales: alienated behavior, frequent class/school absenteeism and low concentration level, compared well with the urinalysis results. Further study is needed to determine the dimension of peer response items within the four subscales, to improve the usefulness of the instrument by omitting uninformative items, so reducing them for future studies.

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