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The Relationship between Self-Reported and Urine Drug Test Obtained Substance Abuse among Adolescent Secondary School Students in Umuahia

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Abstract: ***Background: Self-reporting may under estimate or even over estimate prevalence of substance abuse, justifying the need for an objective estimate of the burden among adolescents. There has been varying reports in different settings on the relationship between self-reporting and urine drug testing in drug use surveys. Therefore, the relationship between these methods commonly used in estimating prevalence needs to be established in our environment. Objective: To determine the relationship between urine drug testing and self-reported substance abuse in Umuahia. Materials and methods: Cross sectional descriptive study of 400 adolescent students in urban and rural secondary schools in Umuahia. Substance use status was established by self-reporting and urine toxicology screen. Data obtained were analyzed using SPSS version 20. P values ≤ 0.05 were accepted as significant. Results: There was a weak relationship between self-reporting and urine drug testing in diagnosing cannabis, cocaine and opioid abuse among study participants (ρ=0.03, 0.01 and 0.03 respectively). There was also no agreement between the prevalence of cocaine, cannabis and opioid abuse by self-reporting and UDT (k= 0.011, 0.107 and 0.012). Conclusion: Drug use studies using an objective tool like urine drug testing gives a better estimate of drug use status of participants than self-reporting. However, the spectrum of currently abused drugs needs be established by self-reporting as UDT kits have limited number of materials in its panel and this may be unable to capture all substances of abuse among participants.***

Keywords: Relationship, self-reported, urinedrugtest, adolescents, secondary school, students, Umuahia, south-east, Nigeria

1. Introduction

Over the years, substance abuse has been changing in rates from one setting to another. Most studies in developing countries are based on self-reports and this may overestimate or under-estimate the rates of substance abuse in such areas. The varying prevalence and pattern of substance abuse requires that more objective tools be used for drug use studies. Self-reporting and urine drug testing, commonly used for drug use surveys may document rates at variance and affect the integrity of preventive measures proffered.

Substance abuse has remained a public health concern despite concerted efforts at curbing the trend .[1]The recent trend of transition from established addictive substances to cocktail of food additives and beverages by drug abusers makes it more difficult to identify substance abusers.[2] For instance, a lot of mixtures of stimulants are now been abused like "Omi Gutter"- mixture of codeine, refnol, tramadol and water/juice/yoghurt, MM- a combination of Maggi, a seasoning salt and malt drink, Lacatomtom- La Casera apple drink mixed with tramadol and Tom Tom sweet, Skoochies- a lethal derivative of Monkey tail and mixture of gin, fresh lime juice, cranberry juice/zobo, tramadol, refnol and juice from boiled marijuana, TM- tramadol, among other concoctions. These substances produce metabolites that alter the mood of drug abusers.[3] Until recently, these were not seen as potential instruments of abuse and it is possible that more of similar materials may be currently experimented on by drug abusers. When drugs and materials making up our normal prescriptions are used at frequencies and doses higher than the usual safe levels, they may become addictive.[4]

The self-report method has been the most common modality of obtaining information in most researches on substance abuse but is susceptible to underreporting. Social stigma and bias associated with drug abuse and possible legal consequences are some of the reasons for the underreporting. Drug use surveys done recently in developed countries like the United States of America, apply more objective tools like toxicology screens (urine drug testing).[5,6]Varying results have been documented by urine drug screening and self-reporting (use of questionnaires). While some studies [7,8] have found a good concordance between the two methods, others have not.[5, 9, 10] The United States department of education survey on the effectiveness of Mandatory Random Student Drug Testing (MRSDT) reported a higher illicit drug rate of 22% from self-report surveys compared to a lower rate of 16% obtained from students urine drug tests for illicit drugs.[21]

Drug testing has become increasingly common over the last decade.[6]Employers test their employees for alcohol and illegal drugs as a measure to improve safety within the workplace.[6] On-site drug testing is used in many healthcare settings in developed countries to monitor abstinence or offer prescriptions.[6] Parents test their children and/or family members to deter them from using illicit drugs at home.[6] Most studies [11-13,14,15]on adolescent substance abuse in Nigeria were based on self-reporting with no association with on-site urine drug testing. Onifade*et al*[16]screened the urine of students for psychoactive substance and documented a prevalence of 0.1%, 0.1% and 0.4% for

cannabis, methamphetamine and opiates respectively. Since self-reports may poorly estimate the drug use status of adolescents, [5, 9, 10] a more objective estimation needs to be used to determine the prevalence and pattern of substance abuse among adolescent secondary school students in Umuahia. The relationship between self-reporting and urine drug testing in diagnosing substance abuse among adolescents needs to be established and the factors associated with substance abuse, sought to help improve the National data base and provide the platform for better policies on adolescent healthcare planning.

2. Materials and Methods

This cross sectional descriptive study enrolled a total of 400 adolescent secondary school students who met the inclusion criteria. Modified WHO student drug use questionnaire and urine toxicology screen, were used to establish their drug use status. The prevalent rates of cocaine, cannabis and opioid obtained by these tools were compared using Spearman rho correlation coefficient and Cohen kappa statistics. P values ≤ 0.05 was accepted as significant.

3. Results

A total of 400 adolescent secondary school students whose completed questionnaires matched their urine drug testing were enrolled for this study. Of the 400 students, 213 attended urban schools and resided in urban areas while 187 who attended rural schools, resided in the rural area. Three hundred and fifty four of them were in mixed schools and forty six in single sex schools. Two hundred and forty-five of these students were schooling in public schools while one hundred and fifty five were in private schools. Also 136 students were boarders while 264 students were non-boarders.

Table I shows the relationship between self-report and urine drug testing for substance abuse among the students. The three drugs that were commonly self-reported and detected in confirmatory urine tests were cannabis, cocaine and opioid (Tramadol). There was a weak association between the ranks obtained by these tools (p=0.456)

Table I: Relationship between self-reported drug abuse and urine drug testing

Self-reported						
Urine test	Cannabis		Cocaine		Tramadol	
	Spearman rho	p	Spearman rho	p	Spearman rho	p
THC	0.03	0.541	0.01	0.862	0.03	0.456
COC						
Opioids						

Level of agreement between current self-report and urine drug testing for substance abuse among the students

Table II shows the level of agreement between the prevalence of substance abuse by current self-report and urine drug testing. There was no agreement between self-reporting and urine drug testing for cocaine, cannabis and opioids (k=0.011, 0.107 and 0.012).

Table II: The level of agreement between current self-reported abuse and UDT.

	Urine test				
Self-report	**Yes**	**No**	**Total**	**Kappa**	**P value**
Cocaine					
Yes	2(66.7)	1(33.3)	3(100)	0.011	0.314
No	152(38.3)	245(61.7)	397(100)		
Total	**154(38.5)**	**246(61.5)**	**400(100)**		
Cannabis					
Yes	38(50.7)	37(49.3)	75(100)	0.107	**0.016***
No	116(35.7)	209(64.3)	325(100)		
Total	**154(38.5)**	**246(61.5)**	**400(100)**		
Tramadol					
Yes	16(41)	23(59)	39(100)	0.012	0.733
No	138(38.2)	223(61.8)	361(100)		
Total	**154(38.5)**	**246(61.5)**	**400(100)**		

Percentages in parenthesis
***Statistically significant**

Sensitivity and specificity of self-report in relation to urine drug testing for cannabis, cocaine and opioid abuse.

Self-reported substance abuse as shown in Table III had a low sensitivity of 19.1% in accurately diagnosing cannabis, opioid or cocaine abuse in study participants. However, the specificity of a questionnaire screening these substances for abuse was 69.8 %. The ability of self-reporting to identify an adolescent substance abuser was 15.3 % while its ability to correctly screen a non-drug abuser was 75.1 %. The accuracy of self-reporting was 58.5 % using urine drug testing as the gold standard.

Table III: Sensitivity and Specificity of Self-reported cannabis, cocaine and opioid abuse

	Drug test results		Total
	Positive	Negative	
Substance Abuse			
Positive self-report	17	94	111
Negative self-report	72	217	289
Total	89	311	400

Sensitivity = 19.1% (12.4 – 25.8%),Specificity = 69.8% (65.3 – 74.3%), *PPV* = 15.3% (9.9 – 21.6%), *NPV* = 75.1% (70.2 – 79.9), *Accuracy* = 58.5% (53.5 – 63.4%)

4. Discussion

The relationship between self-reported substance abuse and urine drug test obtained abuse was weak in current study. This agrees with reports by Onifade *et al*,[16] Bassiony *et al*,[17]Diguisto *et al*[18], Ashrafi and colleagues[19] and Ozoh and his group[23]whose subjects' self-reported rates were in weak agreement with obtained UDT findings. The degree of this weak relationship obtained in present study, was significant for cannabis compared to cocaine and opioid abuse. The reason may be due to adolescents' tendency to admit using only licit drugs just to belong to a safer group even when untrue. Information regarding illicit drug use may not be self-reported unless an objective tool like a urine drug test is applied. In addition, there was no agreement between these two tools in diagnosing cocaine, cannabis and opioid abuse in current study (k= 0.011, 0.107, 0.012). This may further suggest that perceived fear of reprimand or outright

punishment by the authorities account for under-reporting documented in most studies. [19,20, 21] This weak relationship between these diagnostic tools as obtained in present study justifies the use of a gold standard tool like a UDT in drug use surveys.

The positive predictive value of self-reported substance abuse in the present study was 15.3% showing that only a few self-reported substance abusers were confirmed by urine drug testing. The negative predictive value of self-reported substance abuse was 75.1% showing that the modified WHO student drug use questionnaire was able to identify most non-drug abusing participants. The sensitivity of self-reported substance abuse in this study was 19.1% while the specificity was 69.8%. This agrees with the finding of Ashrafi and colleagues[19] who documented a self-reported sensitivity was 15%. The specificity obtained in current study agrees with the finding of Kader and colleagues[23] in South Africa but lower than 87.7% obtained by Ashrafi and co-workers [19] in Azerbaijan. The accuracy of 58.5% obtained in current study was lower than the concordance rate of 87.7% reported by Ashrafi*et al*,[19] showing the low validity of self-reported substance abuse.. Therefore, urine drug testing should be used in drug use survey to obtain an objective estimation of substance abuse. However, the use of well-structured questionnaires and UDT kits in drug use surveys, guide the investigator on the spectrum of drugs been abused as well as an objective estimation of actually abused drugs by study participants.

5. Conclusion

Drug use studies using an objective tool like urine drug testing gives a better estimate of drug use status of participants than self-reporting. Current study showed a weak relationship between current self-report and UDT for use of cocaine, cannabis and opioid. Therefore, the WHO student drug use questionnaires(adapted to study environment) and Icup6 urine drug testing would be useful in drug use surveys. While the spectrum of drugs abused is best established by the former (WHO questionnaire), an objective UDT estimates the actual drugs abused by study participants.

6. Recommendation

More urine test kits with provision for locally abused drugs need to be developed and used for drug use surveys in our environment.

Conflict of interest: None

Sponsorship: None

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