

**Identifying hidden psychotropic substance abusers among patients attending the  
Accident & Emergency departments in Hong Kong**

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## **Contents**

Background	3 - 4
Objectives and purposes	5
Methods	6 - 9
Results	10 - 11
Discussion	12 - 14
Limitations	15
Conclusion	16
References	17 - 19
Table 1. Drug Abuse Screening Test-10 (DAST-10)	20
Table 2. Subject recruitment	21
Table 3. Characteristics of the positive cases in the 1st stage of screening	22
Table 4. Subject-defined characteristics of subjects completed the DAST-10 survey	23 - 24
Table 5. Clinical characteristics of subjects completed the DAST-10 survey	25
Figure 1. Distribution of DAST-10 score	26

## **Background**

Problems arising from psychotropic substance abuse are not uncommon encounters in the Accident & Emergency departments (AED). Of the 3700 reports to the Hong Kong Poison Information Centre in 2013, of which the majority were from local AED, 14.5% of cases were related to substance abuse.<sup>1</sup> In fact, the AED is often the first point of contact with the healthcare system by substance abusers. A study in the U.S. has shown that drug abusers were 30% more likely to use the emergency departments than non-drug abusers.<sup>2</sup> Identification of patients presenting with substance related complications should not be difficult to the AED staff. Apart from the well-known medical complications, however, there are various health outcomes linking to substance abuse, including unintentional injuries, road traffic accidents, physical violence injuries, behavioural problems and infectious disease emergencies resulting from risky behavior like self-injection.<sup>3,4</sup> It is often a challenge for the AED staff to detect the underlying drug problem in patients with these covert presentations. Patient denial or under-reporting are some of the reasons that make their identification difficult.<sup>5</sup> Some of these hidden substance abusers may not even recognize their substance use as being problematic or may be embarrassed to ask for help.<sup>6</sup>

Identifying these hidden substance abusers when they use the AED services is crucial because of two reasons. First, overseas studies have shown that the emergency departments were usually the only source of medical care for substance abusers. Very often, they do not have a primary care clinician or routine medical care other than the emergency departments, or are from the lower socioeconomic class.<sup>7,8</sup> Their AED attendance may be the only chance that they can be approached by the healthcare system. Second, early identification of these hidden abusers in the AED setting allow initiation of measures that may be beneficial to them. A study by the World Health Organization (WHO) found reduction in drug use in patients receiving a brief

intervention using feedback based on the WHO Alcohol, Smoking, and Substance Involvement Screening Test.<sup>9</sup> Studies done in the emergency department setting have also demonstrated a decrease in drug use after intervention based on the Screening, Brief Intervention, and Referral to Treatment (SBIRT) approach.<sup>10,11</sup>

In Hong Kong, the annual attendance of all AED is over 2 million. However, there is no study or data about the prevalence of psychotropic substance abusers attending the AED with covert presentations. The magnitude of the problem thus remains unknown. According to the 63<sup>rd</sup> report by the Central Registry of Drug Abuse, there was a decline of reported drug abusers from 2008 to 2013.<sup>12</sup> Despite this decline, the median length of drug abusing experience of newly reported abusers has more than doubled from 1.9 years in 2008 to 4.6 years in 2013.<sup>12</sup> This highlights the fact that the drug abuse problem has been becoming more and more hidden. With over 2 million attendance a year, the AED could be an appropriate setting to evaluate the magnitude of problems associated with hidden substance abusers.

## **Objectives**

In this study, hidden substance abusers were defined as those patients presenting to the AED with complaints not directly related to substance use and the history of substance abuse was not self-reported at the time of presentation. This definition is different from the general meaning of "hidden drug abusers" adopted by stakeholders in the anti-drug sector. According to the general meaning, "hidden drug abusers" refers to drug users who are not (yet) identified by or in contact with the help network and/or law enforcement agencies.

Because of the lack of data about the hidden substance abusers attending the local AED and the increasingly hidden nature of substance abuse in Hong Kong, this study aimed at:

- (1) providing an estimate of the prevalence of hidden substance abusers among the AED patients and
- (2) investigating the characteristics of these hidden substance abusers attending the AED.

## **Purposes**

- (1) Knowing the prevalence can inform the policy makers about the magnitude of problem of hidden substance abuse among the AED patient population and help determine whether it is worthwhile to implement screening programme for substance abuse in the local A&E setting
- (2) Knowing their characteristics enables the AED staff to identify them earlier and more easily, thus therapeutic or rehabilitative interventions can be instituted promptly.

## **Methods**

### **Design:**

This was a prospective observational study comprising of two stages of screening for substance abuse. The study extended from 1 November 2016 to 31 August 2017.

### **Setting:**

The study was conducted in the AED of United Christian Hospital (UCH), Pamela Youde Nethersole Eastern Hospital (PYNEH) and Tuen Mun Hospital (TMH). Only 3 out of the 17 AED in Hong Kong were chosen as pilots. This was because of the concern of increasing the workload of the AED staff in the presence of the already heavy workload of the local AED. These 3 AED were chosen because they have a dedicated toxicology team in their department which specializes in the care of patients with drug-related problems. These 3 AED (UCH, PYNEH, TMH) had an annual attendance of 182962, 140520 and 219838 respectively in 2016. They accounted for 24% of all A&E attendance in Hong Kong in that year.<sup>13</sup>

### **Participants:**

In the first stage of screening for substance abuse, eligible subjects were those aged 18 years or above who presented to the AED for medical treatment. They should be able to understand Chinese or English and were capable of giving informed consent. They were excluded if they presented with life-threatening conditions or conditions requiring immediate medical interventions i.e. triage category I to III patients, acute psychosis, impaired cognition or intoxication, withdrawal or adverse reaction associated with illicit drug use. Non-Hong Kong residents were also excluded. Convenience sampling was used for subject selection in the first stage of screening. As many subjects as eligible would be recruited. If the result of the first stage of screening was positive, the subject would be invited to complete the second stage of screening.

Screening procedures and tools:

Research staff was posted at the triage station in each of the 3 AED. Subjects were recruited in five 8 hour sessions distributed from Monday to Sunday each week during the subject recruitment period. On average, there were 20 sessions each month. The five sessions were arranged in cycles of P-A-A-N-O-O, where A denoted 08:00 – 15:59, P 16:00 – 23:59, N 00:00 – 07:59 and O was rest day. This arrangement ensured sampling of subjects attending at different times of a day on any day of a week. After registration and triage assessment, the research staff would identify suitable subjects with the help of the triage nurse. Subjects eligible for the first stage of screening were then invited by the research staff to take part in the first stage of screening. One subject would be approached by the research staff at a time. If the subject refused, the research staff would then check the eligibility of another patient being or to be triaged at the triage station. This practice should minimize selection bias by the research staff. If verbal consent was available and subject's privacy was ensured, the research staff would ask a single question about substance use: 'How many times in the past year have you used illicit drug or used prescription medication for non-medical reasons?' The question was translated to Chinese for Chinese speaking patients. This question had been validated for screening for substance use in the primary care setting in a US study. It had 100% sensitivity and 73.5% specificity.<sup>14</sup> In this US study, the question was applied to ambulatory patients attending a primary care clinic at an academic medical centre. Based on the criteria for patient inclusion in the study, the patients selected were similar to those triage category IV and V patients i.e. semi-urgent and non-urgent cases, seen in the local A&E setting. Therefore, it should be reasonable to assume that this question is applicable in the present study. An answer of at least one time was considered positive. Patients who gave a positive answer to the question of screening would be invited to

the second stage of screening. After obtaining written informed consent, the data about the subject defined characteristics would be collected from the subjects by direct questioning, followed by the administration of the Drug Abuse Screening Test – 10 (DAST-10) questionnaire by the research staff. The original DAST was developed in 1982 and consists of 28 items.<sup>15</sup> In view of the heavy workload of the local AED, the shortened form, DAST-10, is considered more appropriate for the local setting. (Table 1) This shortened form has been proven to be a useful screening tool.<sup>16</sup> For Chinese speaking patients, a validated Chinese version of DAST-10 was used.<sup>17</sup> The sensitivity of DAST-10 for identifying illicit drug use ranged from 79.2% to 33.3% and specificity ranged from 67.7% to 99.7% with a cut-off score from 1 to 3 or higher. In general, subjects with a score of 3 or above are considered having a moderately severe or severe problem of drug abuse.

#### Data collection and processing:

Data were directly entered by the research staff into a pre-designed electronic data form on a tablet personal computer or laptop. Relevant clinical data were obtained from the electronic database of the Hospital Authority. All patient identifiers were delinked from the data entered. Approval had been obtained from the Institutional Review Board of each study site.

#### Outcome measures:

The primary outcome in this study was the prevalence of hidden substance abusers among the AED patients as reflected by the number of subjects giving a positive answer to the question in the first stage of screening and those with a DAST-10 score of 3 or above. Other outcome measures included patient-defined characteristics i.e. demographics, smoking, alcohol use, the type(s) of drug used as volunteered by the patients and characteristics related to the AED attendance.

#### Data analysis:



Descriptive statistics were used to describe the subjects and the scores of DAST-10. The prevalence of hidden substance abusers was expressed as the proportion among the AED patients attending the 3 AED during the study period. Significance test for comparison between groups was by chi square test. Regression analysis was used to evaluate the relationship between the substance abuse status (DAST-10 score) and different subject defined and clinical characteristics. A p-value < 0.05 was considered significant. Analysis was done by Statistical Package for the Social Sciences (Windows version 23.0; SPSS Inc, Chicago [IL], US).

## Results

Subject recruitment was conducted in the AED of UCH from 1/2/2017 to 31/8/2017, PYNEH from 1/11/2016 to 31/8/2017 and TMH from 1/3/2017 to 31/8/2017. The recruitment period differed in each site because of the different time of availability of research staff. A total of 8248 triage category IV and V patients from these 3 sites were successfully recruited for the first stage of screening. 76 of them (0.9%) gave a positive answer to the screening question in the first stage. The percentage was the highest in Tuen Mun and the difference from the other 2 sites was statistically significant. (Table 2) The characteristics of these 76 positive cases in the first stage of screening were shown in table 3. Of these 76 positive cases, there was male predominance. Over half of them were aged between 18 and 39 years. All of them were invited to the second stage of screening by the DAST-10 questionnaire.

Only 35 out of 76 subjects (46.1%) consented to complete the questionnaire survey. The main reasons for not participating in the second stage of screening were lack of interest (72%) and that they had quitted the use of drugs for a long time (20%). Their characteristics were shown in table 4 and 5. Of note, most of them lived in public housing (65.7%) and had a positive history of conviction (62.9%), smoking (80%) and alcohol consumption (60%). About 45% were unemployed. Methamphetamine was the most common drug of abuse. The majority consumed drugs fewer than 10 times in the previous 4 weeks of the survey. Nearly half of them had first exposure to drugs in adulthood. About 68% of them had attempted to seek professional help. Clinically, the majority presented to the AED with injuries. Besides the problem of drug abuse, they usually had good health. Only a minority (17.1%) had background of psychiatric illness.

Of these 35 subjects, 32 (91.4%) had a DAST-10 score of 3 or above. (Figure 1) On further analysis, the older a subject first exposed to drugs, the higher the DAST-10

score (odds ratio [OR] 6.13, 95% confidence interval [CI]: 3.21 – 9.52), and subjects who abused cocaine had a significantly higher DAST-10 score (OR 1.93, 95% CI: 1.02 – 2.89).

## Discussion

This is the first local study that intended to estimate the magnitude of hidden substance abuse among patients attending the AED. The number of subjects (76 out of 8248) who were possibly hidden substance abusers as revealed by this study was small. Because of the limitations in this study, the number of hidden substance abusers is likely underestimated. However, if one takes the 0.54 million attendances of the 3 study sites annually into consideration, it may be reasonable to postulate that hidden substance abuse among the local AED patients is not prevalent.

In the medical literature, most studies on substance use by patients presenting to the emergency departments were conducted in the West, especially the United States. In these studies, very often self-reported and unreported drug use by patients were studied together,<sup>5</sup> alcoholism was also included as substance use,<sup>7</sup> a single drug was investigated<sup>18</sup> or a specific group of patients was studied e.g. patients with psychosis.<sup>19</sup> If the issue of hidden substance use is not singled out for examination, the prevalence of substance use among emergency department patients remains largely uncertain. The main source of uncertainty lies in the way substance use is detected. If detection is by self-reporting, the prevalence is estimated to range from 1% to 5%. If biomarkers are obtained, the prevalence could be as high as 40%.<sup>20</sup> Because of the difference in cultural and socio-economic characteristics, comparison with the situation in Hong Kong by direct extrapolation from the findings of these studies is not possible. It is widely accepted that substance abusers are more likely to use an emergency department, nonetheless.<sup>2, 21, 22</sup> This observation is likely applicable in Hong Kong as the medical consequences of substance use are unlikely to be different between individuals in different localities.

Despite the inability of this study to give an accurate prevalence of hidden substance abuse in the AED patient population, it still yielded some useful

conclusions. Judging from the latest finding of downward trend of reported drug users<sup>23</sup> and the postulation of a low prevalence of hidden substance abuse among AED patients, universal screening for substance abuse is possibly not cost effective in the local AED setting. However, no concrete recommendation can be made unless the true prevalence is known. On the other hand, substance abuse is associated with multiple adverse outcomes, be it medical, psychological or socio-economical. Ways to identify substance abusers should still be sought. In this study, it was shown that most positive cases in the first stage screening were males and patients aged between 18 and 39. In addition, Tuen Mun had a statistically significant, higher percentage of positive cases in the first stage of screening than the other 2 sites. While this study was not designed to explain the difference in prevalence in different sites, it does suggest that there is geographical variation in prevalence of substance abuse among the patients attending different AED. As a result, it might be reasonable to propose targeted screening of males aged from 18 to 39 attending the AED in selected districts in Hong Kong. This may increase the yield of the screening and minimize the burden to the AED staff, in view of the already heavy workload in the AED. Obviously, a territory-wide study is necessary to identify which AED may have a higher prevalence. Further, if screening is put into practice, it is usually done by nurses at triage. Resistance is expected because of the extra workload. Commitment by the management, training and adoption of a simple but validated screening tool are necessary to overcome this foreseeable resistance.

The 35 subjects who completed the DAST-10 questionnaire provided a glimpse of the characteristics of the hidden substance abusers. The majority of them had a DAST-10 score of 3 or above, suggestive of at least a moderately severe problem of substance abuse. According to the developer of the score, further investigation and intensive assessment is recommended.<sup>15</sup> This finding is not unexpected in the face of

a median drug abuse history of 4.6 years before identification for the hidden abusers as revealed by the Central Registry of Drug Abuse.<sup>23</sup> Unfortunately, no immediate intervention would be given to these patients unless the patients are having a critical medical condition. Further, first drug exposure at an older age and cocaine use were associated with a higher DAST-10 score. The exact reason is unclear and may require further investigation.

In general, this group of hidden substance abusers were similar to the reported drug users of the Central Registry in most of the subject defined characteristics. They are age distribution, gender distribution, employment status, educational attainment, marital status, types of quarters, conviction history and the popular drug of abuse.<sup>23</sup> Clinically, injuries were the common reason of AED presentation. This is compatible with findings of overseas studies. For example, in an US study, injury was a predictor of undeclared current substance use (OR 1.12, 95% CI 0.7 – 2.0).<sup>5</sup> This may be explained by the risky behavior associated with and the cognitive impairment resulting from substance use. In contrary to overseas findings, co-existing psychiatric problems were not common among these 35 subjects.<sup>18,19</sup> Whether this is related to the hidden nature of their problems is unknown. Further studies are required to elucidate the cause. Regarding the usefulness of these characteristics in early identification of substance abuse, and thus early intervention, it is inconclusive. A bigger sample of hidden substance abusers is necessary to give a more comprehensive picture of their characteristics.

## **Limitations**

There are several limitations in this study. The results of prevalence need to be interpreted with caution because of selection bias, information bias and limitation of screening method. This study only included 3 AED as study sites. Fourteen AED were not included. This may affect the results of prevalence as this study has already suggested the presence of geographical variation in prevalence. Although measures had been taken to reduce selection bias in recruiting subjects for screening, it cannot be ascertained that the research staff did not approach to subjects who appeared difficult. Substance use is a sensitive issue, if not a social stigma. Responses by the subjects were self-reported and not validated. They might have given only socially desirable answers to the research staff. The single question used in the first stage of screening has not been validated in the local AED setting. This may limit its performance in screening subjects and more likely result in an underestimation of the true prevalence. To increase the reliability of the findings, validation study of this single question in the local AED is required. If there is doubt, derivation of a new screening tool suitable for local use may be needed.

## **Conclusion**

Hidden substance abuse is probably not a prevalent problem in the local AED setting. Non-targeted screening in the AED is probably not cost effective. Targeted screening of male patients aged between 18 and 39 in selected AED may increase the yield. This study has provided a snap-shot of the characteristics of hidden substance abusers. They are largely similar to the drug users reported to the Central Registry of Drug Abuse. To have a more accurate picture of the issue of hidden substance abuse in the AED patient population, consideration should be given to improve subject recruitment and screening method.



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**Table 1.** Drug Abuse Screening Test-10 (DAST-10)

These questions refer to the past 12 months.

Question	No	Yes
Have you used drugs other than those required for medical reasons?	0	1
Do you abuse more than 1 drug at a time?	0	1
Are you always able to stop using drugs when you want to?	1	0
Have you had blackouts or flashbacks as a result of drug use?	0	1
Do you ever feel bad or guilty about your drug use?	0	1
Does your spouse (or parents) ever complain about your involvement with drugs?	0	1
Have you neglected your family because of your use of drugs?	0	1
Have you engaged in illegal activities in order to obtain drugs?	0	1
Have you ever experienced withdrawal symptoms when you stopped taking drugs?	0	1
Have you had medical problems as a result of your drug use?	0	1

Score is calculated from the response, yes or no. The higher the score, the greater the degree of problems related to drug abuse. Score 0: no problems reported; 1-2: low level; 3-5: moderate level; 6-8: substantial level; 9-10: severe level.

**Table 2.** Subject recruitment

	Number of screened case in the first stage	Number of positive case in the first stage*	Number of case completed the second stage
PYNEH	4848	14 (0.3%)	7
UCH	1149	13 (1.1%)	10
TMH	2249	49 (2.2%)	18
Total	8248	76 (0.9%)	35

\* There was significant difference in proportion of positive cases between sites ( $p < 0.01$ )

**Table 3.** Characteristics of the positive cases in the 1<sup>st</sup> stage of screening (N=76)

	Frequency	Percentage
Gender		
Male	54	71.1
Age distribution (years)		
18 – 29	22	29.0
30 – 39	25	32.9
40 – 49	10	13.2
50 – 59	15	19.7
60 – 69	4	5.3
70 or above	0	0
Triage category		
IV (semi-urgent)	57	75
V (non-urgent)	19	25
Attendance time		
08:00 – 15:59	33	43.4
16:00 – 23:59	30	39.5
00:00 – 07:59	13	17.1

**Table 4.** Subject-defined characteristics of subjects completed the DAST-10 survey (N=35)

Characteristic	Frequency
Age distribution (years)	
18 – 29	10 (28.6%)
30 – 39	12 (34.3%)
40 – 49	7 (20.0%)
50 – 59	6 (17.1%)
60 – 69	0
70 or above	0
Gender	
Male	27 (77.1%)
Marital status	
Single	17 (48.6%)
Married	14 (40.0%)
Divorced	4 (11.4%)
Educational level	
Primary or lower	6 (17.1%)
Secondary	26 (74.3%)
Tertiary	3 (8.6%)
Types of quarters	
Public housing	23 (65.7%)
Private housing	6 (17.1%)
Others	6 (17.1%)
Occupation	
Student	1 (2.9%)
Unemployed	16 (45.7%)
Employed	11 (31.4%)
Self-employed	7 (20.0%)
Conviction history	
Yes	22 (62.9%)
Smoking history	
Yes	28 (80.0%)
Drinking history	
Yes	21 (60.0%)
Type of drugs abused in the previous 4 weeks <sup>#</sup>	

Cannabis	8 (15.1%)
Ecstasy	1 (2.9%)
Methamphetamine (Ice)	14 (36.4%)
Cough mixture	5 (14.3%)
Cocaine	3 (8.6%)
Ketamine	5 (9.4%)
Heroin	7 (20.0%)
Others	10 (22.6%)
Frequency of drug abuse in the previous 4 weeks	
0 – 10 times	13 (37.1%)
11 – 20 times	6 (17.1%)
21 – 30 times	8 (22.9%)
> 30 times	8 (22.9%)
Average expenditure on drugs per month	
\$ 1000 or less	15 (42.9%)
\$ 1001 - \$2000	8 (22.9%)
> \$2000	12 (34.3%)
Age of first drug abuse (years)	
12 or lower	2 (5.7%)
13 – 18	16 (45.7%)
> 18	17 (48.6%)
Attempts to seek professional help	
Yes	24 (68.6%)

# Some subjects abused more than 1 drugs. Therefore the percentages do not add up to 100%.



**Table 5.** Clinical characteristics of subjects completed the DAST-10 survey (N=35)

Characteristic	Frequency
Triage category	
IV (semi-urgent)	33 (94.3%)
V (non-urgent)	2 (5.7%)
Time of attendance	
08:00 – 15:59	17 (48.6%)
16:00 – 23:59	12 (34.3%)
00:00 – 07:59	6 (17.1%)
Mode of AED arrival	
By ambulance	9 (25.7%)
Reason of AED consultation	
Illness (non-trauma)	11 (31.4%)
Injuries	24 (68.6%)
Number of comorbidity requiring regular medical attention	
None	22 (62.9%)
1	6 (17.1%)
2	3 (8.6%)
3	3 (8.6%)
4 or more	1 (2.9%)
Suicidal history	
Yes	2 (5.7%)
Psychiatric history	
Yes	6 (17.1%)
Disposal after AED consultation	
Admission	9 (25.7%)
Discharge	26 (74.3%)

**Figure 1.** Distribution of DAST-10 score (N=35)

