

# The National Addiction Research Program: prevalence of alcohol and substance use among women in Cairo

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## Background

Drug abuse has been considered a male problem. Studies from several areas including epidemiology, behavioural pharmacology and neurosciences have taken a male-centric approach when analysing factors and/or treatments that influence drug abuse. This approach has led to a neglect of factors underlying drug abuse in women. Therefore, the extent and effects of drug abuse on women are not fully understood.

## Objective

The aim of this study was to determine the prevalence of substance misuse and dependence among women residing in Cairo, Egypt.

## Participants and methods

This is the fourth phase of the National Addiction Research Program. A total of 12 708 female residents from Cairo were interviewed in two waves: 2008 and 2009, according to a stratified sampling design. A specially designed questionnaire with questions derived from the Addiction Severity Index (ASI) was applied to all participants.

## Results

A total of 3413 participants reported having tried smoking at least once in their life (26.8%), and 1802 participants reported using illicit substances at least once in their life (14.2%). Recreational and occasional patterns of substance use were reported by 2.5 and 2% of women, respectively, whereas regular use and abuse/dependence were more common (4.8 and 4.9%, respectively). Lower levels of education are related to higher prevalence of substance use, as well as higher prevalence of substance use in the separated, widow and divorced than single than married females. Women in the age range of 20–35 years had the highest rate of substance use. Cannabinoids were the most frequently used substances among the study sample (6.9%), followed by alcohol (3.8%) and opioids (2.7%).

## Conclusion

The prevalence of substance use among women in Cairo is increasing (compared with a similar study published in 2009). The true prevalence of substance use in Cairo is probably higher than that reported, bearing in mind the extent of under-reporting. However, the extent of abuse/dependence detected in this study is unexpectedly high, probably because of sample composition and level of researcher training.

## Keywords:

abuse, dependence, prevalence, substance misuse, women

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## Introduction

Historically, drug abuse has been considered a male problem. Studies from several areas including epidemiology, behavioural pharmacology and neurosciences have taken a male-centric approach when analysing factors and/or treatments that influence drug abuse. This approach has led to a neglect of factors underlying drug abuse in women. Therefore, the extent and effects of drug abuse on women are not fully understood (Anker *et al.*, 2011).

Women are diagnosed with significantly lower rates of overall substance abuse and dependence disorders

compared with men; however, specific rates may vary according to the class of the drug (Robins *et al.*, 1984; Kessler *et al.*, 1994). They are also much less likely to experience difficulties with substance abuse and dependence, and these disorders are ignored when discussing women's mental health (Schmidt *et al.*, 1990). This may also be because of the fact that women tend to seek help in nonaddiction specialty settings such as in physicians' offices or mental health facilities Graham *et al.*, 2003a.

Estimates suggest that ~4–18% of women will experience serious problems with alcohol or drug abuse/

dependence at some time during their lives (Kessler *et al.*, 1994; Vogeltanz and Wilsnack, 1997). This is not an insignificant number for women in the USA. In addition, many women who do not have diagnosable alcohol disorders engage in 'problem drinking' (Vogeltanz and Wilsnack, 1997). However, although rates of substance abuse and dependence among women are lower than those among men, these disorders are more frequent among women when compared with other conditions such as dysthymia and many anxiety disorders. Therefore, it is important not to underestimate either the frequency of these disorders among women or the impact of these disorders on the mental health of women who experience these difficulties (Wilsnack *et al.*, 1994).

In fact, over the centuries, the predominant sex that abused drugs has varied from female to male, depending on cultural conditions (Kornetsky, 2007). However, in recent years, epidemiological research has shown that women are catching up and have surpassed men in terms of drug use, particularly younger women. Thus, current research should be directed at acknowledging that sex is a vulnerability factor in drug abuse and studying the neurobiological basis for this trend and its implications for drug abuse treatment (Ashley *et al.*, 2003; Marsh *et al.*, 2004).

The National Addiction Research Program was launched in 1996 with the specific aim of obtaining reliable and valid information on the extent of smoking, alcohol and substance use in Egypt. To date, the program has surveyed 26 of the 29 governorates. This study presents the results for women residing in Cairo governorate.

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### Aim of the work

The aim of this study was to determine the lifetime and current prevalence and sociodemographic characteristics of substance misuse among women residing in Cairo, Egypt.

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### Participants and methods

#### Study design

This was a cross-sectional community survey of a stratified sample of the Egyptian population aged 16 years and above. The sample was retrospectively adjusted for population demographics so as to represent the composition of the parent population and help calculate adjusted prevalence rates. Trained health service social workers collected the information using a standard questionnaire by means of one-to-one interviews.

In this study, to determine the prevalence of substance misuse among women, they were extracted from the total sample of the susceptible population subgroups. The program was funded by the Ministry of Health and aimed at surveying 18 districts in Cairo in two waves over 2 consecutive years using the same methodology.

#### Research team and training

The study team consisted of a central group and eight peripheral field groups. The field group consisted of

a supervisory committee and field investigators. The supervisory committee facilitated and monitored the study at the local level and reported to the central group. Each group supervised between 20 and 30 social workers and psychologists recruited from the health district.

A minimum of 3 days of training were provided to each field group. The training covered all aspects of the study design: its objectives and results of previous findings, guidance on use of the research instrument to ensure a mutual understanding of each structured question, and follow-up of field work once it gets under way. The training also included guidance on how to alleviate anxiety about confidentiality and how to conduct a friendly interview. Researchers were equipped with telephone numbers of the national substance misuse hotline in case a need for treatment arose.

#### Sample and sampling process

Each field researcher was responsible for a given number of participants (usually 200–300). The researchers were supported with official approvals while visiting public schools, local universities, professional centres of work for skilled workers, local clubs, homes and public outpatient clinics. The latter two options were used to recruit unemployed women for the study. The participants were recruited from areas where the susceptible groups could be found in order to facilitate sample collection (convenience sample). Each researcher approached participants using a set of demographic criteria based upon population demographics. The stratification of the sample aimed at ensuring that particularly vulnerable groups, youth and skilled workers were included in sufficient numbers in the study. The study opted for recruitment of participants outside their homes whenever possible to reduce the chances of false negative reports on substance abuse through better anonymity. Each participant was approached individually for informed consent to participate in the study. The researchers often worked in pairs.

The national population census of 2006 was the reference for this study (CAMPAS, 2006). At the beginning, all 33 districts of Cairo were studied for the population density and sex distribution of youth aged 16 and above, as well as their social and economic level.

The socioeconomic class distribution in Cairo was estimated as follows: 20% belonging to high, 30% belonging to low and 50% belonging to middle, social and economic classes. Eighteen of the 33 districts of Cairo were included to represent different socioeconomic classes. Because of the large sample size (12 708), the study was divided into two waves over 2 consecutive years, each involving nine districts (Table 1).

#### Questionnaire preparation and training

This study was based upon the application of a standard questionnaire in face-to-face interviews. The history of substance use was partly derived using the Arabic version of the Addiction Severity Index (ASI) (McLellan *et al.*, 1980). The remaining questions covered demographic and social characteristics, tobacco use and dependence

**Table 1 Sample distribution across the 18 districts**

	District
First Wave	
1	El-Wayly
2	El-Marg
3	Helwan
4	Misr El-Qadema
5	Heliopolis
6	Shobra
7	Manshiyat Naser
8	Madinat Nasr
9	El-Maadi
Second Wave	
10	El-Basateen
11	Hadayek El-Kobba
12	El-Zatoun
13	El-Zawya El-Hamra
14	Madinat El-Salam
15	El-Sayedat Zeinab
16	El-Nozha
17	Madinat Mayo
18	Bab El-Shaarea

and beliefs related to illicit substance use. All 75 questions were structured and quantitative and ensured differentiation between experimental, recreational and regular use as well as abuse/dependence.

Face validity was studied through pilot application of the study questionnaire to 200 participants from each district. The researchers gave feedback on each question for a valid assessment and a potential for confounding alternative answers. The questionnaire was modified accordingly.

An inter-rater reliability study of the questionnaire was completed using data from 447 participants who used this questionnaire. The results indicated an excellent  $\kappa$  agreement between the field investigators on the final substance use statuses of the participants ( $\kappa = 0.94$ ,  $P < 0.0001$ ). The questions assessing substance use in the questionnaire followed a plan, beginning with common beliefs about alcohol and drug use to questions about tobacco, then assessing recreational use, regular use, as well as abuse or dependence.

A total of 40 607 participants were interviewed over two consecutive years (2008 and 2009) in the 18 districts. Each participant was informed of the study nature. The participants were assured of confidentiality with respect to anonymity and the results of the questionnaire. The researcher was commissioned to offer any needed psychiatric and social help to all participants. Verbal consent was obtained from each participant in the study.

#### Detection of substance abuse/dependence

Because field investigators are not medically trained or qualified to make diagnostic decisions, this study does not distinguish between abuse and dependence. Training emphasized the following variables when deciding on the presence of abuse/dependence:

- (1) Evidence of increasing the dose to obtain the same effect (tolerance).
- (2) Presence of at least one withdrawal symptom among a list of 13 or an additional specified symptom.
- (3) Use of an injection method of intake of substances.

- (4) Attempts at abstinence followed by reinstatement.
- (5) Frequent use of more than once a week on a regular basis.
- (6) Presence of medical, psychological or social problems due to drug use.

#### Statistical analysis and quality measures

Data were entered into an SPSS spreadsheet and analysed using the SPSS 16 software (2011; IBM Corporation, Louisiana, USA). Because of the large sample size, the statistical significance was set at  $P$  value less than 0.001.

Lifetime prevalence to date was calculated by dividing the number of those reporting having ever used drugs by the total sample. Point prevalence refers to the proportion of individuals currently using drugs.

The prevalence rates were adjusted retrospectively for population composition in relation to sex, age and education distribution. Population statistics were derived from the latest 2006 national census (CAPMAS, 2006); this was done by adjusting the sample composition to comply with population composition and then estimating the total prevalence by calculating the number of individuals in each category based on the actual detected prevalence in that category. The total prevalence was then calculated from the adjusted total number of individuals.

In total, 40 607 questionnaires were revised before data entry by part time workers. This resulted in exclusion of 1999 (4.9%) questionnaires for the following reasons:

- (1) In all, 1231 questionnaires were of participants who refused to cooperate at some stage before the end of the interview (response rate 97%).
- (2) In all, 768 questionnaires were excluded because of markedly incomplete or discrepant or inconsistent data.

Double data entry was ensured for all participants. A computer program compared the two entries for each participant, and the answers in the questionnaire were revised in case of a discrepancy. The proportion of missing data on all 75 questions varied between 0 and 5%.

## Results

### Sample distribution between the two waves

Table 2 shows that there were a total of 4490 participants in the first wave and 8218 participants in the second wave. It can be seen that 13.1% of women in the first wave and 14.7% of those in the second wave were users.

### Prevalence of substance use

The prevalence of smoking and alcohol and other substance use in the whole sample is illustrated in Table 3. It was seen that the lifetime prevalence of tobacco smoking was 11.4% among women who used substances and was 15.4% for nonusers. The lifetime prevalence of shisha smoking was 6.04% among users and 5.1% among nonusers.

The lifetime prevalence of substance use was 14.2% (13.8% in the first wave and 14.4% in the second wave), whereas

**Table 2 Sample distribution across the two waves**

	N (%)
First wave	
User	589 (13.1)
Nonuser	3901 (86.9)
Second wave	
User	1206 (14.7)
Nonuser	7012 (85.3)
Total	
First wave	4490 (100)
Second wave	8218 (100)

**Table 3 Prevalence of smoking and substance use**

	N (%)		
	First wave	Second wave	Total
Lifetime prevalence			
Tobacco smoking			
User	401 (84.8)	1051 (87.1)	1452 (11.4)
Nonuser	605 (17.1)	1356 (19.3)	1961 (15.4)
Shisha smoking			
User	176 (37.7)	592 (49.1)	768 (6.04)
Nonuser	185 (4.7)	467 (6.7)	652 (5.1)
Drug use	616 (13.8)	1186 (14.4)	1802 (14.2)
Current prevalence			
Tobacco smoking			
User	352 (59.8)	967 (80.2)	1319 (10.4)
Nonuser	771 (19.8)	835 (11.9)	1606 (12.6)
Shisha smoking			
User	159 (27.0)	502 (41.6)	661 (5.2)
Nonuser	564 (14.5)	314 (4.5)	878 (6.9)
Drug use	408 (12.8)	895 (37.9)	1303 (10.3)

the current prevalence of substance use was 10.3% (12.8% in the first wave and 37.9% in the second wave).

**Age at onset of smoking and substance use**

As shown in Chart 1, the majority of women started smoking at the age of 16–19 years (39.1% of women in the first wave and 41.4% in the second wave). Among them, those in the second wave who were also substance users had their first exposure to the substance at the age of 20–25 years (44.0%) and those in the first wave had their exposure after 25 years of age (29.8%).

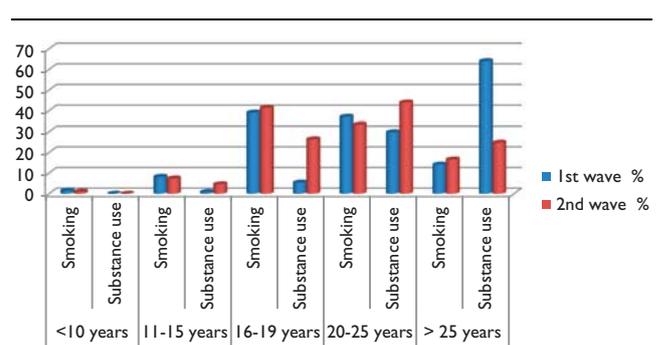
**Pattern of substance use**

In the first wave, the lifetime prevalence of experimental, occasional and regular substance use patterns was more than that of the abuse/dependence pattern. However, the latter was noticeably the most prevalent pattern in the second wave (43.6%), as shown in Table 4. This finding could be explained by the inclusion of districts known for high prevalence of substance use, such as El-Basateen, in the second wave.

**Type of substance use**

As shown in Chart 2, cannabinoids were the most frequently used substances in both waves (32.6% in the first wave and 62.8% in the second wave), followed by alcohol, tramadol and lastly other opioids. Cough mixtures, benzodiazepines, Maxton forte and volatile solvents were not commonly used by the participants.

**Chart 1**

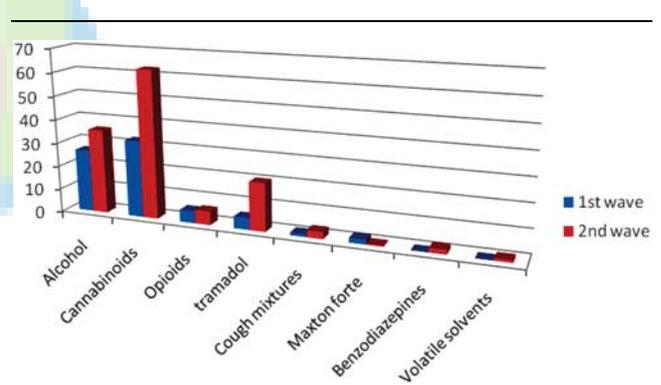


Age at onset of smoking and substance use.

**Table 4 Pattern of substance use**

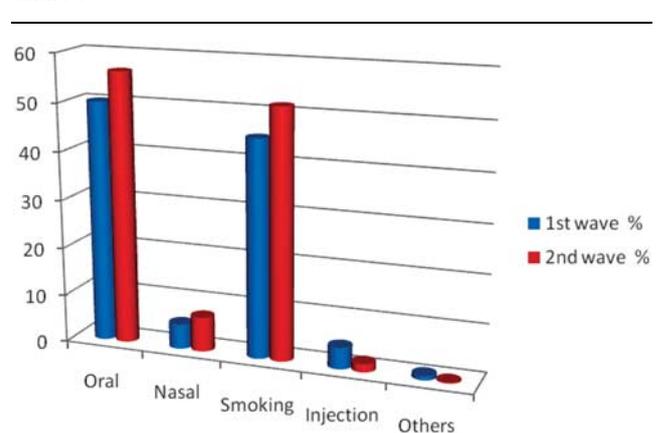
	N (%)			
	Experimental	Occasional	Regular	Abuse/dependent
First wave	133 (22.6)	134 (22.8)	231 (39.2)	91 (15.4)
Second wave	183 (15.2)	124 (10.3)	373 (30.9)	526 (43.6)

**Chart 2**



Type of substances mostly used by participants.

**Chart 3**



Method of drug use.

**Table 5 Demographics of the sample participants (users and nonusers)**

	First wave [N (%)]		Second wave [N (%)]	
	User	Nonuser	User	Nonuser
Age group				
15–19	58 (8.8)	598 (91.2)	79 (7.9)	925 (92.1)
20–25	175 (16.2)	904 (83.8)	316 (19.2)	1327 (80.8)
26–35	166 (16.6)	832 (83.4)	309 (15.9)	1636 (84.1)
36–45	111 (11.8)	831 (88.2)	269 (15.2)	1499 (84.8)
46–55	60 (11.1)	482 (88.9)	157 (11.8)	1172 (88.2)
56–65	13 (7.1)	170 (92.9)	66 (15.0)	373 (85.0)
> 65	4 (9.1)	40 (90.9)	5 (7.6)	61 (92.4)
Level of education				
Illiterate	105 (17.5)	495 (82.5)	162 (11.9)	1195 (88.1)
Primary	62 (15.7)	332 (84.3)	165 (18.1)	745 (81.9)
Preparatory	26 (11.8)	195 (88.2)	113 (13.5)	727 (86.5)
Secondary or equivalent	100 (9.3)	971 (90.7)	270 (12.9)	1830 (87.1)
Upper intermediate	73 (15.3)	405 (84.7)	132 (15.6)	713 (84.4)
University	211 (12.7)	1456 (87.3)	357 (17.0)	1749 (83.0)
Occupation				
Specialist	37 (7.2)	475 (92.8)	99 (9.7)	922 (90.3)
Office work	84 (11.6)	639 (88.4)	149 (13.1)	991 (86.9)
Free labourer	38 (23.8)	122 (76.3)	103 (28.5)	258 (71.5)
Labourer	34 (21.1)	127 (78.9)	102 (21.7)	368 (78.3)
Merchant	18 (35.3)	33 (64.7)	59 (59.0)	41 (41.0)
Student	171 (13.8)	1067 (86.2)	236 (15.4)	1294 (84.6)
Housewife	145 (11.0)	1178 (89.0)	379 (11.9)	2810 (88.1)
Unemployed	40 (19.0)	171 (81.0)	68 (24.0)	215 (76.0)
Marital status				
Single	249 (13.6)	1584 (86.4)	426 (17.1)	2072 (82.9)
Married	245 (11.4)	1905 (88.6)	601 (38.4)	4205 (87.9)
Separated, widowed, or divorced	90 (19.3)	376 (80.7)	176 (69.3)	652 (93.3)

### Method of drug use

Chart 3 indicates that the oral method of substance use was the most frequent one in both waves (50.1% in the first wave and 56.4% in the second wave), followed by smoking (45.0% in the first wave and 51.5% in the second wave). Inhalation, injection and other methods of use represented a small percentage.

### Demographic associations of substance use

As shown in Table 5, 13.1% of women were substance users in the first wave and 14.7% were users in the second wave. The prevalence of substance use was significantly higher in the age group of 20–35 years than in other age groups in both waves ( $\chi^2 = 40.1$ ,  $P < 0.0001$  in the first wave and  $\chi^2 = 78.6$ ,  $P < 0.0001$  in the second wave). There is a clear significant relation between lower degree of education and the prevalence of substance use ( $\chi^2 = 28.7$ ,  $P < 0.0001$  in the first wave and  $\chi^2 = 32.6$ ,  $P < 0.0001$  in the second wave). There was also a significantly high concentration of substance use among merchants and free labourers, followed by unemployed individuals, when compared with individuals in other professions as well as students and housewives ( $\chi^2 = 76.9$ ,  $P < 0.0001$  in the first wave and  $\chi^2 = 292.1$ ,  $P < 0.0001$  in the second wave). There was a higher prevalence of substance use among separated, widowed and divorced women, followed by single women, when compared with married women ( $\chi^2 = 21.6$ ,  $P < 0.0001$  in the first wave and  $\chi^2 = 96.8$ ,  $P < 0.0001$  in the second wave).

On studying the effect of parents' presence or absence in the family on substance misuse, it was found that the presence of the mother within the family was associated with the lowest percentage of misuse (11.8% in the first

wave and 14.7% in the second wave). When considering the death of the mother as a contributing factor, it was found that 15.0% of those in the first wave and 13.6% of those in the second wave were substance users. Abandonment by the mother was associated with a higher percentage of misuse (98.9% in first wave and 98.1% in second wave), with the differences being statistically significant in both waves ( $\chi^2 = 98.8$ ,  $P < 0.0001$  in the first wave and  $\chi^2 = 74.5$ ,  $P < 0.0001$  in the second wave). The effect of the presence or absence of the father followed trend similar to that of the mother. The presence of the father within the family was associated with the lowest percentage of misuse (11.3% in the first wave and 14.2% in the second wave). When considering the death of the father as a contributing factor, it was observed that 13.4% of those in the first wave and 13.2% of those in the second wave were users. Abandonment by the father was associated with the highest percentage of misuse (73.3% in the first wave and 80.4% in the second wave), with the differences being statistically significant ( $\chi^2 = 106.8$ ,  $P < 0.0001$  in the first wave and  $\chi^2 = 143.9$ ,  $P < 0.0001$  in the second wave).

### Discussion

In this study, a lifetime prevalence of tobacco smoking was reported by 11.4% of women who used substances and was reported by 15.4% of nonusers. A lifetime prevalence of shisha smoking was reported by 6.04% of users and 5.1% of nonusers. This indicates that the prevalence of smoking among women is rising irrespective of substance use.

Although the prevalence of smoking has slowly been declining in developed countries over the past 20 years, smoking prevalence rates have steadily been increasing in developing countries. It has been projected that the total number of tobacco-attributable deaths will rise from 5.4 million in 2005 to 6.4 million in 2015 and 8.3 million in 2030, with 80% of these additional deaths occurring in developing nations (Mathers and Loncar, 2006). Smoking prevalence rates among men in developing countries are high; the current prevalence among women is low but is projected to rise. According to the World Health survey, the prevalence of current tobacco smoking in Pakistan is 19.1% (32.4% men vs. 5.7% women) (WHO, 2009).

However, there is a trend among young women towards taking up smoking despite cultural and religious obstacles (Ganatra *et al.*, 2007). A rise in tobacco use by young school girls is a major concern, because those who start as children find it hardest to quit. Moreover, there is a dose-dependent relationship between the incidence of diseases and smoking. Women have health risks and consequences of smoking that are specific to their sex.

Moreover, finding of this study supports the notion that smoking is the gateway to other substance misuse. Efforts need to be directed towards increasing the restriction on tobacco smoking, especially among the vulnerable group of adolescents and children.

In this study, the lifetime prevalence of substance abuse among women was 14.2% and the current prevalence was 10.3%. These percentages are clearly higher compared with the findings of previous studies [2.5% in the study by Rakhawy *et al.* (1996) and 1.1% in the study by Hamdi *et al.* (2009)]. The growing problem of substance misuse among women in Cairo can be explained by the increased exposure of women living in larger and more developed communities within the capital to substances when compared with those living in more rural governorates that were studied in 2009. The increased prevalence of family disruption in the city may also be implicated. Higher levels of freedom of expression that women experience in Cairo may enhance the willingness to disclose such a problem to the research team in contrast to the shame and stigma a woman in rural areas would encounter if she disclosed a substance misuse problem. It seems that these likely factors became more prevalent over the past decade, giving rise to a higher prevalence among women when compared with the study carried out in 1996. The findings of this study are consistent with those of The Situation Analysis Report of Impact of Drug Abuse in Egypt, which states that the trend of drug intake in women is rising (WHO-EMRO, 2005). The findings are also consistent with those of an Egyptian study, which reported that drug use among women has been increasing over the past 5 years (Ghanem *et al.*, 2005). These findings are also in agreement with those of the National Household Survey on Drug Abuse, which reported that in the USA, men are more likely than women to abuse drugs, and according to their explanation, these sex-based differences in drug abuse are not related to sex-related differences in susceptibility and in

fact may be related more to the opportunity to use drugs (Van Etten and Anthony, 1999). This plausible explanation supports our finding that women in the metropolitan community of Cairo have an increased probability of exposure to substances compared with women living other governorates in Egypt, and thus the prevalence of substance use is higher among them.

In Canada, women have lower rates of general and, specifically, problematic alcohol use; however, in the past 15 years, there has been an increase in the use of substances by women (Ahmad *et al.*, 2007).

This study revealed that the majority of female users in Cairo had their first exposure to the substance at the age of 20–25 years. This age at onset is lower than that found in the study carried out in the north and south governorates of Egypt, in which 12.2% of users started using substances at the age of 25–34 years (Hamdi *et al.*, 2009). This could be due to the high socioeconomic status of individuals in some districts, which leads to the easier attainment of substances at an earlier age.

Women of a child-bearing age are exposed to social and marital pressures. Aggression and abuse against women are important causes for the increasing rates of substance use in eastern communities. Absence of social support or living with a partner with a substance use problem may also be contributing factors.

The World Health Organization (2008) found that across cultures, approximately one-third of individuals with drug dependence are women of a child-bearing age; our results are in agreement with this finding. The WHO further explained that sex can influence reasons for using (e.g. social pressures), pathways to problematic use (e.g. victimization) and the consequences of use (e.g. absence of social support available to women).

In a 2004 United Nations report, women who abused substances at a child-bearing age were described, in comparison with men, as having fewer resources, being more likely to be living with a partner with a substance use problem, experiencing more severe substance problems at the beginning of treatment, and having higher rates of trauma (United Nations Office on Drugs and Crime, 2004).

Certain factors and other potential health implications are encountered as barriers to treatment, namely, pregnancy, fear of losing custody after the baby is born, fear of prosecution and lack of services for pregnant women. As some women are unemployed or impoverished, financial constraints prevent them from obtaining childcare (SAMHSA, 2008).

Kelley (1998) reported that the child-bearing age is related to experiencing challenging life circumstances, including severe economic and social problems such as housing or homelessness, in addition to the diminished capacity for parenting as well as difficulties in providing stable, nurturing environments for their children.

Prevalence of illicit drug use can be observed across different ages. In 1992, 12% of females aged between 12 and 17 years reported having used an illicit drug during the previous year, compared with 23% of those aged

between 18 and 25 years, 14% of those aged between 26 and 34 years and 4% of those aged 35 years and above. Active use of illicit drugs is most prevalent among individuals aged between 12 and 34 years and peaks at 18–25 years of age; however, the use declines sharply after age of 34. The use of licit substances also peaks at the same period as that of illicit drugs but does not exhibit the same sharp decline with age. Thus, the percentages of women who had smoked within the last year in each of the four age groups were 17, 40, 36 and 26%, respectively (Kandel *et al.*, 1992).

This study revealed that cannabinoids were the most frequently used substances in both waves (32.6% in the first wave and 62.8% in the second wave), followed by alcohol (26.5% in the first wave and 35.8% in the second wave), tramadol (5% in the first wave and 20.3% in the second wave) and lastly other opioids. Cough mixtures, benzodiazepines, Maxton forte and volatile solvents were not commonly used.

Data from the SAMSHA (1992) supported the finding of this study and reported that alcohol and tobacco cigarettes are licit substances and are used by a much larger proportion of the female population compared with illicit drugs. Marijuana was the most prevalent illicit drug. The next most popular illicit drug was cocaine, having been used at some time by 9% of women. The sequence of use goes through three stages during adolescence, which is the period of greatest risk for initiating the use of drugs. The use of alcohol and/or cigarettes, substances that are legal for adults in our society, marks the first stage. The next stage is marijuana use. The third stage is the use of illicit drugs other than marijuana, such as cocaine. Young people are unlikely to experiment with marijuana without prior experimentation with one of the alcoholic beverages or cigarettes; few young people try illicit drugs other than marijuana without prior use of marijuana [New York State (NYS) Follow-Up Cohort] (Kandel, 1975; Kandel *et al.*, 1992; Kandel and Yamaguchi, 1993).

The abuse of alcohol is a rising problem in Cairo, as it is now the second most common substance used (used by 26.5% participants in the first wave and 35.8% participants in the second wave). This could be attributed to the influence of western cultures in Egypt's capital and to the belief that Beer beverages are not addictive. Studies carried out by the East Mediterranean Region Office of WHO, EMRO show that use of cannabis and opioids is increasing considerably in Egypt. A moderately stable use of alcohol was the trend in the preceding 5 years. The use of opiates, sedatives and alcohol is mainly confined to urban areas (WHO-EMRO, 2005).

In this study, tramadol was the third most frequently used substance after cannabinoids and alcohol (used by 5% individuals in the first wave and 20.3% individuals of the second wave). Its intake has increased recently as it is prescribed as postoperative analgesic or as an over-the-counter pain killer.

According to the 2000–2001 CCHS (Canadian community health survey), the percentages of females aged 12 or

older reporting use of selected prescription and nonprescription drugs during the previous year were 23.7% for pain relievers, 2.1% for opioid analgesics, 1.7% for sleeping pills, 1.1% for tranquilizers, 2.1% for antidepressants and 0.4% for diet pills. Women were highly likely to consume benzodiazepines prescribed to them for non-clinical symptoms (Taylor *et al.*, 1998) such as stress from work or home, grief, acute or chronic illnesses, physical pain or adjustment to a major life change (Celentano and McQueen, 1984; Reed, 1987) and were also likely to have them prescribed for longer periods (Jorm *et al.*, 2000).

Overall, the self-reported illicit drug use by women in Canada is low. Data from the 1994 Canada's Alcohol and other Drug Survey (Canada's Alcohol and Other Drugs Survey, 1996) show that of the lifetime use of illicit drugs, the rate of use is 18.7% for cannabis, 3.6% for LSD, speed or heroin, and 2.7% for cocaine.

Volatile solvent abuse reported in this study is much less prevalent than what has been reported internationally (used by 1% individuals in the second wave). This may not reflect the actual size of the problem in Cairo. Solvents are a popular substance among the younger population, especially among street children, including girls. This age group is not represented in the sample of this study, thus giving rise to probably an underestimated prevalence rate.

The prevalence of substance use is significantly lower in females with higher degrees of education ( $\chi^2 = 28.7$ ,  $P < 0.0001$  in the 1st wave and  $\chi^2 = 32.6$ ,  $P < 0.0001$  in the 2nd wave).

This finding is consistent with a huge body of literature such as Droomers *et al.* (1999) which reported that heavier consumption patterns frequently had been found among those with lower educational levels.

It is also consistent with studies using prospective data which had shown that dropping out of high school or leaving college early is associated with an increased risk of alcohol and substance abuse and dependence in adulthood (ASAM, 2003).

This finding, is that of our larger sample of the national addiction research determining the prevalence of substance abuse in Great Cairo. Hamdi *et al.* (2011) demonstrated that; the prevalence of substance misuse in Egypt increases significantly with the decrease in educational level. But it represents the whole sample of all males and females while this study represents an extraction of females only and determining the prevalence of substance abuse amongst them.

The finding of our study is inconsistent with previous results of an Egyptian study in great Cairo residents by Mobasher *et al.* (2006) in their research about spirituality in relation to substance dependence recovery, where the percentage of university of graduated addicts was higher than the percentage of addicts in other educational levels.

It is also inconsistent with Abolmagd *et al.* (2007) where the university education was the level of education most

present in their Egyptian addicts' sample, followed by general secondary education and technical schools.

This finding is inconsistent with data from (Canadian Campus Survey, 1998) that reveal comparatively high rates of illicit drug use among university students: 8.9% of female students reported use of illicit drugs in the previous 12 months (not including cannabis) and 28.0% reported cannabis use.

The inconsistency here may be due to the recruitment of most of the participants from private mental hospitals, and rehabilitation centers where the socioeconomic and educational levels of the sample study higher than those of governmental hospitals.

A significantly high rate of substance use was observed among merchants and free labourers, followed unemployed individuals, compared with individuals in other professions as well as students and housewives ( $\chi^2 = 76.9, P < 0.0001$  in the first wave and  $\chi^2 = 292.1, P < 0.0001$  in the second wave).

This finding is inconsistent with that of the study by Abulmagd *et al.* (2011), who reported that a higher percentage of their study group was unemployed and that a very less percentage of recovering women were employed.

Our findings are consistent with those of Wickizer *et al.* (2000), who compared work statuses, job skills and job readiness between substance-dependent women and nondependent women. They found that the percentage of employment among women who completed treatment programs was only 10% compared with 42% for nonsubstance-dependent women.

Our findings are also in agreement with those of Timko *et al.* (1999), who reported that substance-dependent women were less likely to be employed than substance-dependent men and, accordingly, had a lower average annual income. Grella and Greenwell (2006) and Staton-Tindall (2007) also reported that women who abused drugs and alcohol were less likely to be employed or if employed after treatment earn less money compared with men.

By studying the effect of parents' presence or absence in the family on substance misuse, it has been found that the presence of the mother within the family was associated with the lowest percentage of misuse (11.8% in first wave and 14.7% in second wave). Moreover, death of the mother showed a less association with substance misuse (15.0% individuals in the first wave and 13.6% individuals in the second wave). In contrast, abandonment by the mother was associated with a higher percentage of misuse (98.9% in the first wave and 98.1% in the second wave), with the differences being statistically significant in both waves ( $\chi^2 = 98.8, P < 0.0001$  in the first wave and  $\chi^2 = 74.5, P < 0.0001$  in the second wave). The effect of the presence or absence of the father followed a trend similar to that of the mother. The presence of the father within the family was associated with the lowest percentage of misuse (11.3% in the first wave and 14.2% in the second wave). When considering the death of the father as a contributing factor, it was observed that 13.4% of those in the first wave and 13.2% of those in the second wave were users. However,

abandonment by the father was associated with highest percentage of misuse (73.3% in the first wave and 80.4% in the second wave), with the differences being statistically significant ( $\chi^2 = 106.8, P < 0.0001$  in the first wave and  $\chi^2 = 143.9, P < 0.0001$  in the second wave).

This finding may represent the protective role of a coherent family, although there is a high degree of familial corruption in such families, especially due to marital discord between parents. It also represents the pattern of life in Cairo, encompassing globalization, presence of working women with high incomes and redistribution of financial intentions and orientations.

It is noteworthy that there is a declining association between the death of a parent and substance misuse by children; this may be due to religious beliefs stating death as the fate of God, which have to be completely accepted (Rashed *et al.*, 2002). This result is in agreement with those of UNODCCP-EMRO (2000) that reported that substance abuse is the result of a complex interaction of individual, family, peer, community and societal factors. However, these results should be critically tested in further researches, as it is sometimes unclear whether substance use is the cause or the effect in relation to such familial and social factors.

Our findings are in agreement with those of Wolff (2000), who reported that a single-parent household incurs high demands on the single biological parent, forcing him/her to work more in order to support the family, thus leaving less time for the children. The results of the survey by Garmiene *et al.* (2006) reflected familiar tendencies, namely, only two-thirds of schoolchildren have daily meals with their parents and about one-third of them have a daily talk with their parents on various things. Children and adolescents who spend less time with their parents are more susceptible to developing substance use behaviour. Their survey also confirms the fact that adolescents who share less time with their parents in joint activities are more prone to try smoking and substance abuse.

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### Clinical recommendations

This study indicates that a high index of care should be adopted for women in the community, especially for those with certain demographic characteristics such as a child-bearing age, housewives and family discord.

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### Research recommendations

- (1) Further longitudinal studies to confirm the trends of substance misuse among women are required.
- (2) The relation of changes in the protective or risk factors to abstinence and treatment should be also studied.
- (3) Large-scale studies on women for treatment for substance misuse/dependence will enhance our understanding of the social epidemiology of drug abuse. Barriers to the treatment and the risk factors preventing maintenance of sobriety need to be understood.

## Study limitations

- (1) The influence of stigmas and fear of disclosure on the authenticity of the data collected has not been determined. If there is an effect, it would be that substance misuse and dependence rates are considerably higher than those reported.
- (2) Criminal and legal aspects related to substance use, which are good indicators of misuse, were not assessed.

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## Conflicts of interest

There are no conflicts of interest.

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